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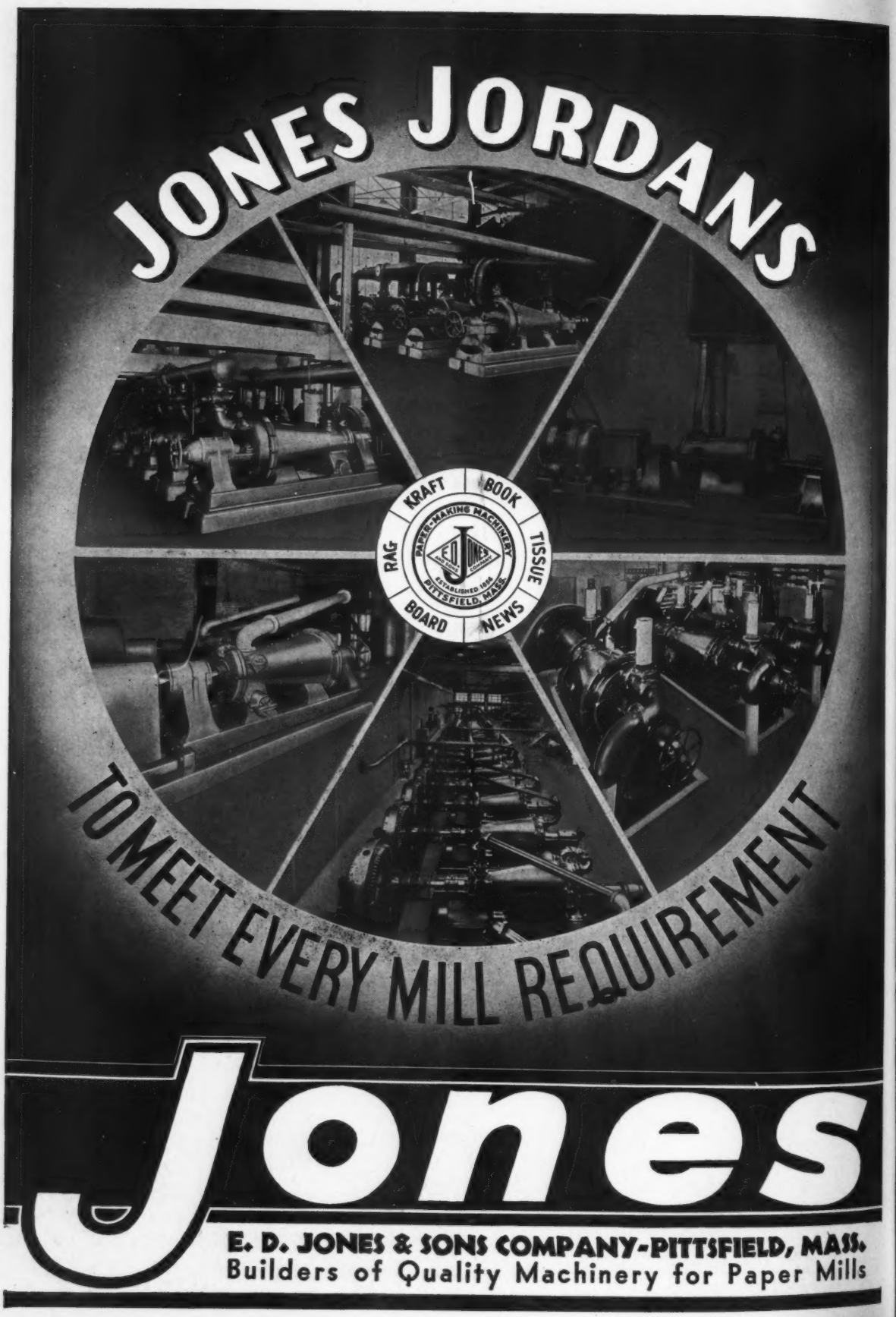

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CONTENTS

APRIL 25, 1940

	PAGE
Printing Committee Requests Bids on Paper	9
Present Minority on Paper Wage Rate	10
Start Mill at South Hadley Falls	11
World Dependent Upon Scandinavia for Pulp	12
New Paper Has Dual Character	12
Harold Collins Heads Wausau Paper Mills	16
Carl Magnus to Manage Brokaw Mill	16
To Hold Sectional Safety Meetings	16
Work on Upper Fox River Dam Starts	18
British Columbia Mills Active	18
T & H Sales Staff Lecture	18
Buys Paper Under Walsh-Healey Act	18
To Erect Pulp Mill at Port Alberni	18
Union Bag Buys Timber Tract	18
Government Paper Bids	19
Britain Issues New Paper Control Order	19
Issue Tru-Color Samples	19
Ajax Paper Co. Shows Movies	19
Financial News	20
Construction News	21
Editorial	22
Pulp and Paper Study Courses	23
Japan Imports Rayon Pulp	23
To Represent L. L. Brown Paper Co.	23
Production Ratio Report	23
Imports of Paper	38
Will Use Old Markle Mill Plate	40
Latest Market Review	42
Miscellaneous Markets	44
Market Quotations	44
Classified Advertising	48

Technical Section *("TAPPI")*

United States Patents on Papermaking	25
The Relation of Starch to Microbiological Problems and Methods for Controlling Bacterial Growth	29
Prosize	33
New TAPPI Members	36

PAPER TRADE JOURNAL IS INDEXED IN INDUSTRIAL ARTS INDEX

INDEX TO ADVERTISING ON PAGE 58

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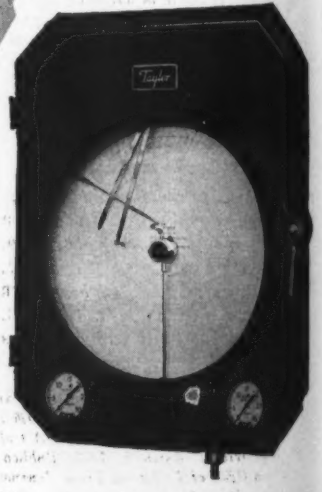

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Printing Committee Requests Paper Bids

Proposals For the Semi-Annual Supply of Paper For the Government Printing Office Will Be Opened May 20—Bids Asked On 47,400,000 Pounds of Various Kinds of Paper — Awards May 27.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 24, 1940—Bids will be received by the Joint Congressional Committee on Printing on May 20 for the semi annual supply of paper for the use of the Government Printing Office and for the annual supply of envelopes for the entire year. The new year will begin July 1.

The committee is asking for bids for 47,400,000 pounds of paper for the half year compared with 46,677,000 pounds which were purchased for the current half year. It is estimated that 92,121,000 envelopes will be used for the coming fiscal year compared with 84,157,000 for the present year. The Committee will meet on May 27 to discuss awards.

The Paper Specifications Committee's report to the Joint Committee regarding paper was as follows:

The Committee on Paper Specifications respectfully submits its Thirty-ninth Report and the accompanying recommended schedule for paper for the public printing and binding and blank paper for the use of the Government departments and establishments in the District of Columbia for the term of 6 months, beginning July 1, 1940.

Paragraphs 45, 46, and 47, of the Instructions under the headings "Sampling, Testing Instruments, and Standard Testing Conditions" have been renumbered 44, 45, and 46, respectively, and a new paragraph 47 inserted under the heading "Expansivity."

Paragraph 65 of the Instructions under the heading, "Packaging," has been modified to provide for clearance under the skid of 9 inches instead of 10 inches.

Paragraph 70 under the heading "Carloading," providing for the method to be followed in the loading of freight cars with paper, has been added to the Instructions.

Lots 1, 4, 5, 11, 17, 30, 31, 36, 40, 160, 162, and 252.—Additional sizes have been added.

Lot 21—50 per cent rag antique book paper—Size 22¾ by 31½ inches.—We have provided that this paper "must be suitable for writing on with ink."

Lots 40 and 252—Size 26 by 38 and 17 by 22 inches. —These two sizes have been deleted because they are no longer needed.

Lots 47, 190, and 192.—The thickness of these papers has been slightly increased.

Lot 62—This is a new item which has been added to the schedule calling for sulphite yellow writing paper No. 32, which shall be in 32- and 38-inch rolls.

Lots 78 and 79—100 per cent rag white manifold. —Rosin sizing has been increased from 1.2 to 1.5 per cent.

Lots 78 and 79, 128, and 129, 140, 168 to 173, 180, and 181.—The folding endurance requirements have been modified to conform more closely to commercial practice.

Lots 276 and 277—Calendered tag.—The specifications for this paper have been modified to improve the quality.

Lot 325—U. S. postal card bristol.—This lot has been equally divided into lots 325 and 326.

This schedule embraces 171 lots, which is two more than the preceding schedule. The quantity estimated for the term of 6 months beginning July 1, 1940, is approximately 47,400,000 pounds, as compared with 46,677,000 pounds for the previous contract period of 6 months.

Approximate Quantities

The approximate estimated quantities of paper are as follows:

800,000 pounds newsprint paper.
4,335,000 pounds machine-finish book paper.
400,000 pounds antique book paper.
500,000 pounds off-set book paper.
90,000 pounds lightweight machine-finish book paper.
260,000 pounds 50% rag antique book paper.
10,000 pounds 75% rag laid antique book paper.
20,000 pounds 100% rag antique book paper.
2,650,000 pounds supercalendered book paper.
730,000 pounds coated book paper.
60,000 pounds lithograph paper.
5,900,000 pounds mimeograph paper.
400,000 pounds U S M O safety writing paper.
5,000 pounds U S M O writing paper.
4,000 pounds safety writing paper.
9,482,500 pounds writing paper.

(Continued on page 19)

Present Minority Report on Paper Wage Rate

Minority Members Unwilling To Assume Responsibility For Inevitable Liquidation of Numerous Small Enterprises — Administrator Will Set Date For Public Hearing After Which Wage Rate Will Be Decided.

WASHINGTON, D. C., April 22, 1940—The minority report and recommendations of Industry Committee No. 11 for the Establishment of a Minimum Wage in the Pulp and Paper Industry as well as the report and recommendations of Arthur S. Hill were filed last week with the Administrator of the Wage and Hour Division of the U. S. Department of Labor. The minority report was signed by A. R. Heron, Stuart E. Kay, Alan G. Goldsmith, Dwight L. Stocker, L. J. Parant, W. J. Alford, Jr.

With the filing of these reports the Administrator now has in his hands a complete paper story. The next step is for the Administrator to set a date for a hearing at which he will preside, or someone will preside for him. After that, the Administrator will reach his decision on rates to be paid in the industry. The Minority report in part is as follows:

Employees Affected

We recognize that only a relatively limited number of employees would be directly affected by the approval of the recommendation of the majority members. However, the minority members are unwilling to assume responsibility for the inevitable liquidation of numerous small enterprises now supporting small communities. Six and one-half per cent of the Wage earners in the primary manufacturing plants, according to the official statistics before the committee, are receiving less than 40 cents an hour. However, the actual employees involved in this six and one-half per cent are unfortunately concentrated generally in the smaller communities, and this situation presents a formidable expense problem for such mills. In the converting plants 19 per cent, or 24,000 employees, are in a similar status.

It is our opinion, emphasized in our discussions in the committee hearing, that the sudden imposition of the maximum possible rate will result in the actual liquidation of a number of these small establishments, and the practical economic liquidation of the communities now supported by those mills. We point out that this opinion was not effectively controverted in the reasoning on which the majority members have based their recommendation. On the other hand, they specifically declared that such unfortunate results must in their opinion be disregarded on the ground that they did not represent "substantial" results in terms of the industry as a whole. With this disregard of the fate of small mills in small communities, on the ground that they are relatively small in total number or total percentage, we disagree. We maintain that the relative importance of the small mill to the economic life of the small community is greater than that of the mill of any size in the large community. Total unemployment in a small community is emphatically "substantial" in the lives of the people who live there.

Cost

The direct additional cost of a 40 cent minimum is not a major element in our opinion in making a decision. However, we know from experience that the direct cost does not measure what the total cost will be. Actual experience when the Wage and Hour Law went into effect, as reflected in statements and exhibits considered by the committee, indicates beyond a doubt that the whole wage structure will be materially affected. Any attempt to estimate at a fraction of one cent per hour the effect on the average wage in the industry, which would result from the adoption of the 40 cent minimum, is admittedly incomplete and in our opinion grossly misleading.

It is our contention that legal or statutory raises in wage levels should be gradual in order that industry may be given an opportunity to adjust itself to new conditions. It should be understood that many mills are already struggling under a vertical raise as a result of the provisions of the Fair Labor Standards Act in October 1938 and again in October 1939. A further sudden rise of 10 cents an hour as a minimum does not meet a reasonable policy of moderation. We have strongly recommended a graduated increase to the minimum set by the law for 1945 and it is our firm belief that such a graduated increase would be in the public interest and in accord with the desire of the Congress.

Converting Operations

In setting a minimum rate under the definition with which we are working, we must recognize that in many cases the mills covered by this definition are inseparably engaged in work which is defined as "converting". At the same time they are in direct competition with independent converting plants. The entire converting industry is to be covered by another industry committee.

In so far as paper manufacturers are engaged in converting operations in their own mills, they cannot avoid adopting in their converting operations the minimum which is fixed for the primary paper industry. But even more important is the practical necessity to recommend for the primary paper industry a rate which will fit both the separate and the inseparable converting operations and which we can reasonably expect will coincide with the recommendations of the converting industry committee when that committee considers the corresponding facts.

If the subsequent committee dealing with the converting industry should recommend, and the Administrator should promulgate, a minimum rate for that industry lower than that which may be adopted for the primary industry, the result would be an extreme competitive disadvantage to the converting activities carried on in the establishments in the primary industry. This competitive disadvantage will create substantial unemployment. The curtailment of converting operations in primary mills will naturally lead to a curtailment of the primary manufacturing operations in such mills which now provide the paper for the integrated converting operations. In our

opinion this is a definite competitive situation which the law directs the committee to consider. Although this competitive disadvantage was cited in the evidence and argument, members of the majority specifically rejected it as not being, in their opinion, within the scope of matters which the law directed this committee to take into consideration. With this rejection we emphatically disagree.

In view of the recommendation of the majority members, we respectfully urge upon the Administrator the advisability, if not the necessity, of withholding a final decision affecting the primary industry until he has had an opportunity to consider the recommendation of the converting industry committee.

Mechanization

As was brought out in the verbal testimony, the sudden rise from 30 to 40 cents, recommended by the majority, would inevitably cause increased mechanization and consequent dislocation of employment. Borderline cases will be determined on the basis of economic necessity and a considerable number of low wage employees eliminated. We feel very strongly that this would be an extremely unfortunate time to add to the rolls of the unemployed without an adequate justification.

Foreign Competition

We contend that if in the administration of the Wage and Hour Act the welfare both of the industry and the workers in the paper and pulp industry is to be protected, the vulnerable position of this industry as related to foreign competition must be given great weight. Any intelligent consideration of this situation would indicate the absolute need for minimum wage rates that will permit the industry and labor to meet contingencies that may arise, more promptly than possible through action by a subsequent industry committee. As an illustration and as an indication of what can and is happening in newsprint and other grades of paper, it should be borne in mind that whereas 30 years ago practically all of the newsprint consumed in the United States was made in this country, today over three tons of newsprint are imported for each ton made in the United States. At the present time foreign competition is particularly severe with respect to wrapping paper, book paper and many grades of processed paper. Average wages for male workers in the paper and pulp industry in Norway, Sweden and Finland were, in 1938, 32 cents, 30 cents and 16½ cents, respectively. The average wage in the United States in the paper and pulp industry, for all employees, male and female, in 1938, was 64 cents an hour. Practically all of the competition for United States paper markets outside of the newsprint market and some of the competition in the newsprint market comes from these countries. The chaotic situation that will arise when the present European war ends should be anticipated at this time.

Industry Policy

The minority members of Committee Number Eleven ask only recognition of the practical aspects involved in your decision and point with pride to the fact that the paper and pulp industry now ranks as one of the leaders among the 25 major industries in the United States in the amount of average annual earnings per employee. The industry is interested in seeing that its employees receive high annual earnings, which we believe to be vastly more desirable than irregular employment at high hourly wage rates. We submit that the latter condition will result if drastic change, such as recommended by the majority of the committee, is put into effect.

We respectfully direct attention to the fact that the recommendation of the majority is concurred in by barely one more than half of the total membership of the committee. The record will indicate that at other times at least half of the total membership of the committee favored the recommendation of a rate lower than the maximum permitted by law. Admitting that the recommendation of a majority of one is the official recommendation of the committee, we further respectfully suggest that the closeness of the vote, coupled with the extreme divergence of views, places before the Administrator the need for exhaustive consideration of the factors presented by the minority members.

Arthur D. Hill's Recommendations

Arthur D. Hill in submitting his report and recommendations said in part:

I voted against fixing a minimum rate of forty cents at the present time. The reason which led me to so vote and which now leads me to dissent from the vote of the committee is the effect on the smaller mills engaged in the industry. From the information produced by the officials of the Department and from the facts stated by other members of the committee, I believe the immediate imposition of the forty-cent rate will result in a closing of a number of such mills and a consequent curtailment of employment in the industry through the discharge of their employees. It is true that such mills are a small proportion of the industry and that it is not probable that all of them will be closed. The proportionate curtailment of employment therefore will not be large. It will, however, be a sufficiently substantial curtailment to be within the meaning of the words as used in the statute. I have no question that the great bulk of the industry could now carry the forty-cent minimum rate of wages, but I think the public interest could best be served by allowing an interval of time sufficiently great to permit the smaller mills to adjust themselves to the change. A large proportion of such mills are situated in small cities and towns. As a New Englander I know what such enterprises mean to the communities in which they are situated and to the men and women whom they employ. I therefore recommend adherence to the thirty-eight cent rate suggested at the hearing.

Start Mill at South Hadley Falls

SOUTH HADLEY FALLS, April 17, 1940 — The Steven's Paper Company, Inc., of Westfield, which recently took over the old Hampshire Paper Company property, has started operations. The company manufactures electrical insulation paper.

The new company employs about 35 on a three-shift schedule under the supervision of R. J. West of Westfield, who will turn over the duties to his brother, Benjamin, superintendent of the local division. The plant, which for years was operated by the Hampshire Paper Company, manufacturers of the famous Old Hampshire Bond, has been completely renovated.

World Dependent Upon Scandinavia for Pulp

Canadian Paper Man Foresees World Shortage of Pulp, Except In U. S. and Canada, If Scandinavian Shipments Cease For Only Limited Period — Great Britain's Requirements — Forestry Council Advocated.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 22, 1940—That if the Scandinavian countries should be prevented from exporting pulp, even for a limited period only, there will result an extreme shortage of paper the world over, with the possible exception of Canada and the United States, is the opinion expressed by John Stadler, prominent consulting engineer and pulp and paper executive, in a letter to the Financial Times, of Montreal.

He points out that of the 5,124,000 tons of pulp exported from Scandinavia and Finland in 1938 Sweden shipped 2,185,000 tons, Norway 566,000 tons and Finland 1,373,000 tons. With Sweden still among the neutrals and Finland at peace again, only Norway's 566,000 tons is theoretically off the world market. Actually, however, Scandinavian exports have shrunk since the beginning of the war, insofar as the U. S. market is concerned, to relatively small proportions due to shipping hazards, high costs and heavy war insurance rates. A notation to a comparative table submitted by Mr. Stadler, points out that, according to reports now available, it would appear that about 35 per cent of Finland's pulp mills have been taken over by the Russians, which no doubt will reduce its exports of pulp in the same proportion.

In stressing the seriousness of the situation, if considered in its broader aspect, and not solely from a Canadian-American point of view, Mr. Stadler states that Canadian journals, in discussing the development, have "emphasized newsprint in particular, and, in regard to pulp, figures have been quoted giving the tonnage the Scandinavian countries supplied to the United States of America.

"The fact that reference has only been made to the American consumption of pulp," he continues, "conclusively proves that we, as Canadians, seem to overlook the fact that pulp as well as newsprint is a world commodity and, consequently, total world's figures must be taken into consideration if we want to emphasize what effect the stoppage of pulp exports from the Scandinavian countries will have on the pulp and paper industry."

Great Britain's Requirements

Increased exports from Canada to Great Britain of newsprint, pulp and various types of timber are expected as a result of the situation in Scandinavia. From trade returns available in Ottawa it appears that of 1,385,000 tons of pulp imported by Britain in the first eight months of 1939, about 80 per cent originated in the Baltic; of approximately 6,350,000 cwt of newsprint imported in the same period, about 25 per cent came from the Baltic countries, now shut off, and 75 per cent from Canada and Newfoundland. Of 954,000 standards (2,000 f.b.m.) of sawn timber about 225,000 standards of planed timber were also imported, 27 per cent were shipped by Canada and 53 per cent by Baltic countries, principally Sweden and Finland. These sawn timber shipments from the Baltic amounted in value to about 30 million dollars. Some of the needs of the timber trade in Britain will doubtless be supplied by British Columbia fir. This was so in the last war. The authorities will also not wish to tie up too many ships in bulky timber traffic, but when it is realized that timber sales to Britain in eight months from the Baltic and Soviet Russia amounted in value to about $63,000,000, it will be seen that even if requirements are pared down very substantially, there is still a field for the expansion of Canada's trade.

Howard Smith Co. Moves Head Office

At a special meeting following the annual meeting of the Howard Smith Paper Mills, Limited, approval was given to the transfer from Cornwall, Ont., to Montreal of the head office of the company.

Harold Crabtree, president, told stockholders that the management expected 1940 to be another good year, short of unforeseen developments. Asked as to prospects for a dividend on the common stock, Mr. Crabtree said the position of the company had improved following reorganization in 1928, and that when the capital position and producing capacity had been further strengthened common stock holders would receive consideration.

Forestry Council Advocated

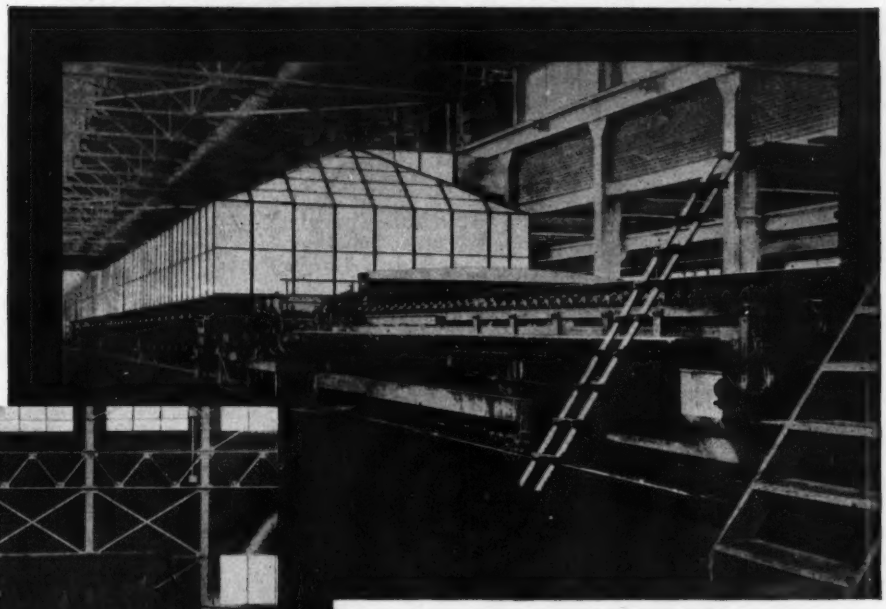
Hon. Frank Carrel, in an address in the Legislative Council at Quebec, advocated a permanent non-political commission or council to govern the exploitation of Quebec's forest resources. He said the problem was not one for drastic legislation to antagonize Canada's customers in United States, but "the time has come when we must make a supreme effort to meet and discuss with our American competitors and consumers the whole problem, with the idea of finding a solution that will be at least fair and just to all concerned.

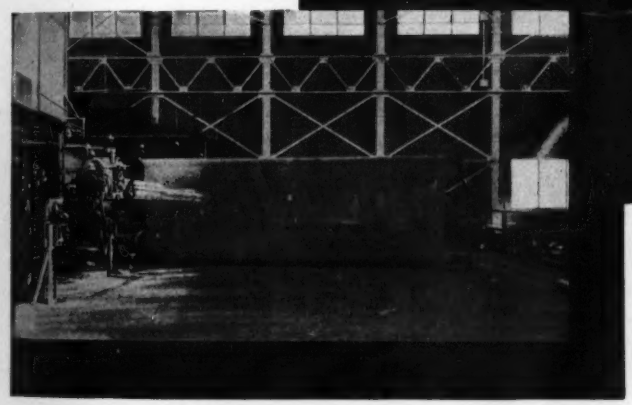
"It is for this reason that I have advocated for many years the promotion of an international commission, representing both interests, the Canadian manufacturers and the American consumers. Was the cleavage between the two interests too wide for such a commission to materialize? If so, we must overcome that cleavage."

New Paper Has Dual Character

Escort ledger and machine posting, one of the four new papers recently announced by the L. L. Brown Paper Company of Adams, Mass., is being offered with the assurance that it is equally adapted to use both as a ledger and for machine posting purposes. The new sample book which is now being distributed emphasizes this point particularly. Escort, which is made from 50 per cent new rag cuttings, is stocked in five weights and six colors in addition to white. Copies of the new sample book may be obtained from the company upon request.

THE BELOIT *Removable Fourdrinier*





● Wire is strung in aisle while machine is in operation, if desired.

● Fourdrinier pit can be washed out while wire is being installed.

● Wire bundle is taken from shipping box and mounted directly in carriage—no chucks to apply—no further handling as bundle is unreeled as carriage moves along to form wire loop.

● All wire poles are mounted in carriage before loop is formed. Inside poles are inserted inside the wire.

● Safest — most convenient — quickest method of installing Fourdrinier wire.

THE BELOIT WAY BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS. U.S.A. **IS THE MODERN WAY**

Court Decree Ends Container Prosecution

Civil Decree In the Case of U. S. Against the National Container Association Ended By Consent Decree Handed Down In Federal Court on April 23 — Decree Outlines Permissive Activities of Trade Associations.

A consent decree ending prosecutions against major companies in the corrugated and fiber container industry was handed down in Federal District Court in New York City on Tuesday afternoon, April 23.

The Department of Justice announced on April 20 that it had presented to the United States District Court for the Southern District of New York a civil decree in the case of United States v. National Container Association in which the defendants are charged with violating the Federal antitrust laws through the use of various trade associations.

Defendants in this case include the National Container Association, a trade association, having as its affiliates a number of regional associations; the Stevenson Corporation, a trade association management concern; and a number of corporations which in the aggregate produce about 65 per cent of the total corrugated and fiber board shipping containers manufactured in the United States. The indictment charges that these manufacturers have used the various trade association defendants to carry out schemes for artificially establishing the price and controlling the production of corrugated and fiber board shipping containers.

The previously announced policy of the Department is that it will accept a decree without litigation only when it is voluntarily proposed by the defendants and when it offers stronger safeguards to protect the public interest in free competition than can be obtained by successful prosecution. In the opinion of the Department, the decree in this case meets these requirements.

To Refrain from Price Fixing

By this decree the defendants offer to refrain not only from the general price fixing and production restriction charged in the indictment, but also propose to eliminate from the activities of their association a number of specified practices which the indictment charges go beyond the sphere of legitimate trade association activities in violation of the federal antitrust laws. The decree enjoins and restrains the defendants, their successors, members, directors, officers, agents, and employees, and all persons acting under, through, or for them, from agreeing, combining, or conspiring among themselves or with any other manufacturer of corrugated or solid fiber board shipping containers.

(a) to limit production of corrugated or solid fiber shipping containers to predetermined quotas;

(b) to formulate, promote, or take part in any plan for prorationing of business, or the equitable sharing of available business, the purpose or effect of which is to limit the production of such containers to such quotas;

(c) to determine the volume of business of manufacturers of such containers for any period or periods for the purpose of establishing such quotas;

(d) to collect, compile, or compare data respecting production, sales, orders, shipments, or deliveries of such containers for the purpose of determining whether manufacturers of such containers have adhered to, or are adhering to, such quotas;

(e) to distribute production, shipment, or price data in such form as to indicate that a manufacturer of such containers is or is not adhering to any such quota;

(f) to present or discuss, at meetings of manufacturers of such containers, or elsewhere, or by correspondence or otherwise, production, shipment, or price data in such form or manner as to indicate that a manufacturer of such containers has exceeded any such quota, or that it should limit present or future production so as to come within any such quota;

(g) to examine or audit the production, shipment, or price records or accounts of manufacturers of such containers for the purpose of securing adherence to any such quota;

(h) to allocate, or to refrain from soliciting, customers of manufacturers of such containers, or to allocate markets or marketing territories among the several manufacturers of such containers;

(i) to fix or maintain prices for such containers;

(j) to use, or to promote the use of, an estimating manual, or any other handbook or device, for the purpose of fixing or maintaining the prices of such containers;

(k) to use, or to promote the use of, predetermined prices for materials, manufacturing operations, or delivery in (i) estimating or pricing such containers, or (ii) analyzing production, price, sales, order, shipment, or delivery data of manufacturers of such containers for the purpose of fixing or maintaining the prices thereof of two or more manufacturers;

(l) to examine or audit the production, shipment, or price records or accounts of manufacturers of such containers for the purpose of fixing or maintaining the prices of such containers;

(m) to compel a manufacturer of such containers (i) to submit copies of invoices to a trade association or like agency, or (ii) to name or identify any customer account in connection with the submission of invoices to such trade association or agency;

(n) to authorize a trade association or like agency to disclose customer invoices (or data as to individual transactions with customers), which have been submitted by a manufacturer of such containers to such trade association or agency, to a competitor of such manufacturer.

Legitimate Trade Activities Not Affected

Neither by conducting the investigation which resulted in the indictment in this case nor by acquiescing in this decree does the Department intend any condemnation of legitimate trade association activities. The primary result of this decree is the elimination of certain practices which appear to contravene the federal antitrust laws. An objective of secondary importance is the clarification of the Department's antitrust

law enforcement policy in respect to trade associations. In addition to the practices enjoined as contravening the federal antitrust laws, the decree defines a number of trade association activities and in particular those relating to the gathering and dissemination of trade statistics which do not appear to be questionable under the federal antitrust laws. Therefore, it should be of assistance in enabling trade associations to define the area for lawful action.

In its affirmative portion, the decree outlined as permissive such activities as gathering and disseminating information as to the cost of manufacture, volume of production and meeting to discuss such data without, however, reaching an agreement on any concerted action with respect to prices or production. The promotion of cost accounting, materials costs data and credit are among the activities held to be legitimate functions of container trade associations.

In the belief of trade association observers the decree can serve as a guidepost to trade associations in the conduct of their activities.

Counsel for the National Container Association was Bethuel M. Webster. Frank H. Elmore, special assistant to Assistant Attorney-General Arnold, represented the Government.

International Paper Nets $5,090,465

In the forty-second annual report of the International Paper Company for the year ended December 31, 1939, Richard J. Cullen, president, stated in his report to shareholders:

"Sales and other income of International Paper Company and subsidiaries totalled $122,308,995 in 1939 as compared with $98,669,250 in 1938. Tonnage sales were 27½ per cent in excess of the previous year. Consolidated net profit amounted to $5,090,465 as compared to $54,794 in 1938.

"During 1939, the companies set aside for taxes—local, state, federal and foreign—a total of $3,753,826. This is equivalent to $3.91 a share on the outstanding 7 per cent preferred stock.

"This total includes property taxes, social security taxes and other taxes not based on income amounting to $2,961,416 as compared to $2,754,979 in 1938.

"At December 31, 1939, 952,666 shares of the 7 per cent preferred stock, 18,127 shares of the 6 per cent preferred stock and 999,685 shares of the common stock of International Paper Company were owned by International Paper and Power Company. In addition International Paper and Power Company holds substantial indebtedness of International Paper Company. This indebtedness originated early in 1929 with cash advances of $11,232,667 made by International Paper and Power Company from the proceeds of sale of its Class C common stock. The indebtedness has fluctuated in varying amounts since then and amounted to $7,081,768 at December 31, 1939."

Discuss Saturday Closing at Boston

BOSTON, Mass., April 22, 1940—Saturday closing during the summer was discussed, but no definite action taken, at a luncheon meeting of the Fine Paper Division of the New England Paper Merchants Association, held Tuesday at the Boston Chamber of Commerce, with Frederick G. Lockwood, vice-president in charge of that division, presiding.

UNITED PIGMENTS
Pure Titanium Dioxide
UNITANE-O

A brilliantly WHITE, pure titanium dioxide possessing excellent . . .

• OPACITY
• BRIGHTNESS
• DISPERSION

Suitable for ALL types of paper ranging from thin printing papers and waxing tissues to coated book and magazine stocks.

UNITANE O—110 was especially developed for paper pigmentation. Its excellent dispersion in water promotes good retention and excellent sheet formation. As a component of the beater furnish, it produces *whiter* sheets of *great brilliance*, and superior printing qualities.

SAMPLES of UNITANE O-110 will be sent promptly upon request.

UNITED COLORS & PIGMENTS

UNITED COLOR AND PIGMENT CO.
DIVISION OF INTERCHEMICAL CORPORATION
NEWARK, NEW JERSEY
SALES OFFICES IN PRINCIPAL CITIES

Harold Collins Heads Wausau Paper Mills

Board of Directors At Annual Meeting of Wausau Paper Mills Company Elects Harold C. Collins President—Wisconsin River Mills In Good Position — To Hold Sectional Safety Meetings — Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., April 22, 1940—Harold C. Collins was elected president of the Wausau Paper Mills Company, Brokaw, Wis., at the annual meeting of the board of directors following the annual stockholders' meeting April 10 at the First American State Bank Bldg., Wausau, Wis. He succeeds Ben Alexander, who was elected chairman of the board.

Several other changes were made. C. C. Yawkey was elected vice-president; Harold Knott, Chicago, vice-president in charge of sales; Carl Magnus, vice-president in charge of production; Aytch P. Woodson, secretary; D. C. Everest, treasurer, and Glenn Stevens, assistant secretary and assistant treasurer. J. S. Alexander, Mr. Everest, Mr. Woodson and Mr. Collins were chosen members of the executive committee.

All Directors Re-elected

All of the directors were re-elected and L. W. Holbrook, Washington, D. C., was made a member of the board at the stockholders' meeting. The board includes all of the officers except Mr. Stevens.

Harold Knott, who became sales executive at the meeting, was associated with the Eastern Corporation for 22 years prior to joining the Wausau Paper Mills Company. During the last 17 years of his connection with the Eastern Corporation, he served as western manager in charge of sales, with headquarters in Chicago. He has been active in the Salesmen's Association of the Paper Foundation, which sponsored and operated the paper industries exhibit at Chicago's Century of Progress Exposition.

Mr. Collins also was elected president of the Yawkey-Alexander Lumber Company at a directors' meeting held last week. Ben Alexander was elected chairman of the board, C. C. Yawkey, vice-president, Aytch P. Woodson, secretary-treasurer, and Paul W. Hoeper, assistant secretary and assistant treasurer. J. S. Alexander of Wausau, and L. W. Holbrook, Washington, D. C., were elected as directors by the stockholders.

Carl Magnus to Manage Brokaw Mill

Carl Magnus recently replaced W. B. Clements as general manager of the Brokaw mill. He came to Brokaw from Mechanic Falls, Me., where for the last four years he was associated with the Waterfalls Paper Company. He is a former president of the American Pulp and Paper Mill Superintendents Association and has been active for a number of years in the Technical Association of the Pulp and Paper Industry.

Beginning his paper mill career in 1915 following graduation from the University of Maine, Mr. Magnus was first associated with the Dill and Collins Paper Company, later joining the Eastern Manufacturing Company. From 1919 to 1921 he was with the American Writing Paper Company, and for the next 15 years served as plant manager of the Standard Paper Manufacturing Company at Richmond, Va.

Wisconsin River Mills in Good Position

Mills in the Wisconsin River Valley have felt little effect from the shortage of pulp caused by the suspension of shipments from Norway and Sweden due to the war. Marathon Paper Mills Company manufactures 75 per cent of its pulp at its mill at Rothschild, Wis., and a mill at Oconto Falls, Wis., owned by this company and Northern Paper Mills, Green Bay. The remaining 25 per cent is purchased on the west coast.

D. C. Everest, president and general manager of the Marathon mills, says paper prices are lagging behind pulp prices, and that the anticipated rise in the price of the former had not materialized. Mills with ample stocks and sources of pulp have been considered as being in a favorable position, with an increase in paper prices in prospect.

Mosinee Paper Mills Company, Mosinee, Wis., is producing its entire pulp requirements in its own plant, and is considered in the most advantageous position of any mill in the area. Norman S. Stone, general manager, says the paper market is now in a state of flux and that few predictions can be made. The condition at Mosinee, he said, is "entirely stable."

Wausau Paper Mills Company, Brokaw, Wis., has no anticipation of immediate difficulty, although its pulp mill is currently shut down, according to Harold Collins, president. Operations can be continued without adjustment for the present, he said.

To Hold Sectional Safety Meetings

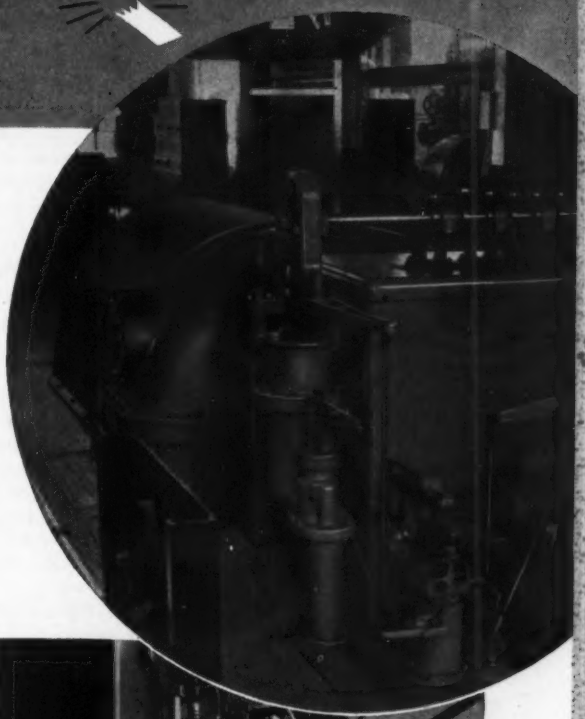
Sectional meetings for executives and foremen of paper and pulp mills will be held in connection with the thirteenth annual Fox River Valley and Lake Shore Safety Conference to be held at Marinette, Wis. Thursday, May 23. Plans were perfected at a meeting at Marinette last week. The committee in charge of the paper and pulp mill section includes Ted Christensen, Marinette, Wis., W. E. Strong, Menasha, Wis., and Rudolph Meyer, Peshtigo, Wis.

A general session will be held in the morning at the Marinette high school auditorium, and several luncheons will be held at noon. One of these will be an industrial and public health nurses' division with Miss Norma Bornfield of the Southern Kraft Corporation in charge. Another will be for personnel and safety directors, with William H. Kuth, secretary-treasurer of the Boreal Manufacturing Company in charge. Other sectional meetings will be held in the afternoon, and there will be a mammoth motorized safety parade at 5:00 P. M.

The annual banquet, which last year drew an attendance of 2,000 and set a record for these conferences, will be held at the high school gymnasium at Menominee, Mich., across the river from Marinette, according to tentative plans. The speaker will be J. Dewey Dorsett of New York City, president of the Executives' Association of the National Casualty Underwriters. Safety awards will be presented.

3 SHIFTS WITHOUT A *Break*

NEW REGULATING SYSTEM PROVES ITS STABILITY IN OPERATION AT SOUTHLAND MILL



WITHIN 10 days after starting at Southland Mill, three six-hour shifts without a break were observed.

Here, despite load swings of as much as *3000 kw* slammed on the power plant by intermittent grinder operation in the wood room, the speed showed hardly a traceable tremor at the paper machine. This means a smooth flow of continuous power is maintained at the paper machine despite heavy fluctuations elsewhere in the plant.

A BIG IMPROVEMENT

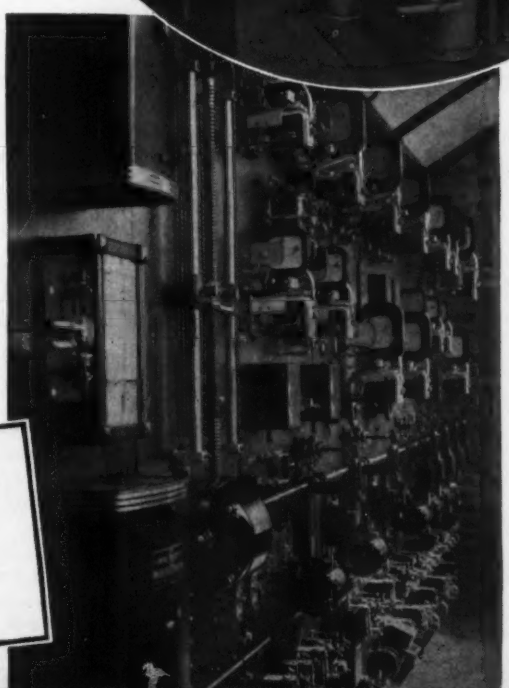
Only a few years ago, sudden variation of this much in plant load (equal to 25 per cent) would have wrecked the web on the paper machine. By expert application of advanced designs of voltage regulators, tied in with the operation of turbine-generator, motors and control, this achievement of keeping voltage stable (and speed constant) at the paper machine is made possible and practical. It is all the more remarkable in that the grinder motors are unusually large, whereas the blocks of power generated are of ordinary amounts—making a variation of 3000 kw a large proportion of the total generated.

Equipment for new accuracy and stability in speed regulation and in voltage regulation is but one of the systems and improvements engineered by General Electric in its unrivaled experience and co-operation with paper and pulp mills and with machinery manufacturers. For information on electrical applications, get in touch with the G-E office near you, stating the specific requirements at your mill, or write to General Electric, Schenectady, New York.

Pusey and Jones paper machine and G-E sectional drive (foreground) in Southland Mill, Lufkin, Texas

In Circle:
Two G-E turbine-generators, and G-E switchgear generate and feed power to the complete plant, including grinders and paper-machine drives.

Voltage regulator and control panel at Southland Mill →



G-E EQUIPMENT AT SOUTHLAND MILL

Paper-machine Drive
Switchgear
Pyranol Power Transformers
Turbine-generators
Winder Drive

GENERAL ELECTRIC

663-1

William Kuh will preside at the general sessions as general chairman and the speakers and their subjects will include: Voyta Wrabetz, chairman of the Wisconsin Industrial Commission, "The Value of Industrial Conferences"; Amos J. Germain, Westinghouse Electric and Manufacturing Company, Chicago, "Progress in the Safe Use of Electricity in Modern Industry"; Dr. A. J. Weber, Milwaukee, Wis., "Back Injuries, Strains, etc."

Work on Upper Fox River Dam Starts

Preliminary work is under way on the rebuilding of the "upper" dam on the Fox River at Appleton, Wis. C. R. Meyer & Sons Company, Oshkosh, Wis., has been awarded the general construction contract on a bid of about $120,000. Its workmen have built a temporary bridge across the headrace at the Wisconsin Michigan Power Company plant, and are doing other work preparatory to the installation of equipment. Heavy construction will be started within a week. The present dam was constructed in 1874 and is obsolete. The new structure will be of concrete and steel. The dam controls flow to most of the paper mills at Appleton.

Safety Envelope Moves to New Quarters

The Safety Envelope Manufacturing Company, 2304 N. 34th St., Milwaukee, Wis., is planning to move about June 15 to larger quarters at 1023 N. Water St. The business is managed by Mrs. Marie Bernhardt, who bought it less than three years ago, and is vice-president of the company. She increased sales 100 per cent last year, necessitating more manufacturing space. Her husband, C. F. Bernhardt, is president of the company. Formerly an official of the Leader Card Works of Milwaukee, she was about the only woman in America who regularly attended the meetings of the National Paper Trades Association, at which some 2,000 men were present. New equipment is to be installed in the enlarged quarters, and new products are to be announced.

British Columbia Mills Active

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., April 20, 1940—British Columbia pulp and paper production last year reached a high level with a gross output of 349,912 tons of products, valued at approximately $17,495,600, according to figures released by the Provincial Forest Service recently.

There was produced 216,542 tons of newsprint, 50,870 tons of other papers, and 82,500 tons of a high-grade pulp exported unmanufactured. This compared with 176,639 tons of newsprint, 39,348 tons of other papers, and 45,000 tons of export pulp produced in the preceding year.

The ten-year average for the industry in British Columbia, forestry records show, has been 235,120 tons of newsprint, 33,045 tons of other papers, and a fluctuating level in pulp exports depending on the markets available.

Last year, with newsprint at $50 a ton, and other high-grade pulp and paper products at approximately the same level, the total value of the output is believed to have been $17,495,600 in Canadian funds.

At present all mills are operating, some on a twenty-four-hour basis, with new machinery installed and in operation at Ocean Falls, provincial foresters said.

T. & H. Sales Staff Lecture

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 20, 1940—Two members of the sales department of Tileston & Hollingsworth have been giving lectures.

Amor Hollingsworth, Jr., spoke recently to the students of the course in Manufacturing at the Harvard Business School, discussing the paper industry. He illustrated his talk with a diagram of one of the machines now in operation at the mill of the company.

Marvin Campbell spoke recently on the manufacture of paper at the school for employees at the Colonial Press, Clinton, Mass., conducted by Chester Garland, with approximately 40 attending. Mr. Campbell showed pictures of papermaking machinery, samples of raw materials and examples of watermarks. A question period followed the lecture.

Buys Paper Under Walsh-Healey Act

WASHINGTON, D. C., April 24, 1940—During the week ended April 6, the Government purchased $94,448.96 worth of paper and allied products under the Walsh-Healey Act as follows: $25,486.65 worth of manifold paper for the Navy Department from Marquette Paper Company, Chicago, Ill.; $12,973.24 worth of wrapping paper for the Navy Department from Paper Corporation of U. S., N. Y. C.; $25,725.08 worth of bond paper for the Navy Department from L. Hyman & Sons, N. Y. C.; $17,211.49 worth of paper for the War Department from R. P. Andrews Paper Company, Washington, D. C.; and $13,052.50 worth of file folders for the War Department from Majestic File Folder Corporation, New York City.

To Erect Pulp Mill at Port Alberni

VANCOUVER, B. C., April 20, 1940—Bloedel, Stewart & Welch, one of the leading lumber firms in British Columbia, now plans to establish a pulp mill at Port Alberni on Vancouver Island. This new step is regarded as one of the most significant industrial developments in British Columbia in several years. Work will start immediately on the erection of a new mill which will have capacity of 135 tons of unbleached sulphite pulp daily.

Entry of Bloedel, Stewart & Welch into the pulp field will give British Columbia five major producing units in this industry, the other being Powell River Company, Pacific Mills, Ltd., Crown Zellerbach Corporation, and B. C. Pulp and Paper Company.

Union Bag Buys Timber Tract

SAVANNAH, Ga., April 20, 1940—A timber tract consisting of 3,323 acres of land located opposite the nine-mile post on the Augusta road, known as the W. S. Godley tract, has been purchased by the Union Bag and Paper Corporation. The large block of land was bought from S. A. Allen, and according to a warranty deed filed yesterday, the purchase price was $12,000.

Marion S. Kahler, manager of the woodlands department, said that the property was bought to insure future pulp wood supply for the paper corporation. Describing the newly-acquired land, Mr. Kahler stated that it was in one solid block, and has been well protected from fire, consisting of a great deal of young timber growth.

Government Paper Bids

WASHINGTON, D. C., April 24, 1940—Government Printing Office has received the following bids for 80,000 pounds of supercalendered book paper in 38 inch rolls: Whitaker Paper Company, 5.3 cents; Mudge Paper Company, 4.75 cents; R. P. Andrews Paper Company, 4.49 cents; Barton, Duer & Koch Paper Company, 5.55 cents; Stanford Paper Company, 4.64 cents; Old Dominion Paper Company, 5 cents; Paper Corp. of U. S., 5 cents; and Frank Parsons Paper Company, 4.73 cents.

For 65,000 pounds (2,000,000 sheets) of 21 x 32 white sulphite manifold paper: Import Paper Company, 7.2 cents less 2%; Old Dominion Paper Company, 7.443 cents; Whitaker Paper Company, 8.35 cents; R. P. Andrews Paper Company, 8.5 cents; Virginia Paper Company, 8.41 cents; Barton, Duer & Koch Paper Company, 8.5 cents; Stanford Paper Company, 12 cents; Marquette Paper Company, 7.48 cents; and Paper Corp. of U. S., 7.835 cents.

For 40,000 pounds of yellow sulphite writing paper in 38 inch rolls: R. P. Andrews Paper Company, 6.2 cents; Whitaker Paper Company, 5.59 cents; Barton, Duer & Koch Paper Company, 6.01 cents; Mudge Paper Company, 5.62 cents; Stanford Paper Company, 5.9 cents; and Mathers-Lamm Paper Company, 5.7025 cents.

For 780 pounds (3,000 sheets) of 26 x 40 buff antique cover paper: R. P. Andrews Paper Company, $136.50; and Stanford Paper Company, $162.00.

For 30,000 pounds (15,100 sheets) of binders board: Resolute Paper Products Corp., 5.05 cents less 2%; R. P. Andrews Paper Company, 4.95 cents; Barton, Duer & Koch Paper Company, 4.75 cents.

For 320,000 pounds of newsprint paper: National Pulp and Paper Company, 3.26 cents; and Old Dominion Paper Company, 3.2824 cents.

For 85,400 pounds (700,000 sheets) of 28 x 34 white sulphite writing paper: Whitaker Paper Company, 4.98 cents; Mudge Paper Company, 5.63 cents; R. P. Andrews Paper Company, 6.3 cents; Barton, Duer & Koch Paper Company, 5.48 cents; Stanford Paper Company, 6.06 cents; Graham Paper Company, 6.45 cents; Mathers-Lamm Paper Company, 5.62 cents; and Paper Corp. of U. S., 5.14 cents.

Britain Issues New Paper Control Order

WASHINGTON, D. C., April 24, 1940.—According to a cable just received from the American Consulate in London, paper control Order Number 11, effective April 13, reduces the amount of paper and paperboard which United Kingdom paper mills can supply customers, except under license, during the three months period ending June 1, 1940, to 30 per cent of the amount supplied during the same period in 1939, instead of the 60 per cent quota allowed under control of paper Order Number 8, licenses already issued to supply or convert paper also are reduced by 50 per cent. Deliveries to government departments for direct export continue to be exempted from these restrictions. The Ministry of Supply announcement indicates that licenses to supply or convert paper will be issued only for purposes essential to national interest, mentioning as one example the requirements of useful export trade. Owners of stocks of paper are advised to exercise the utmost economy in their use, since it may not be possible to sanction further supplies when these stocks are exhausted.

REQUESTS BIDS ON PAPER

(Continued from page 9)

560,000 pounds map paper.
1,210,000 pounds manifold paper.
6,986,000 pounds bond paper.
994,000 pounds ledger paper.
1,245,000 pounds index paper.
3,500 pounds tissue paper.
340,000 pounds cover paper.
520,000 pounds manila paper.
605,000 pounds kraft paper.
1,500 pounds paraffin paper.
250,000 sheets gummed paper.
118,000 pounds blotting paper.
2,500 pounds stereotype molding paper.
15,000 pounds oiled manila tympan paper.
5,000 pounds plate-wiping paper.
5,000 pounds back-lining paper, for case making.
10,000 pounds high finish red sulphite.
170,000 pounds manila tag board.
1,100,000 pounds calendered tag board.
20,000 pounds manila cardboard.
165,000 sheets railroad board.
390,000 pounds bristol board.
6,000,000 pounds United States postal card bristol board.
25,000 sheets pressboard.
7,000 pounds news board.
1,012,000 pounds chip and strawboard.
20,000 pounds marble grained board.
36,000 pounds box board.
360,000 pounds binder's board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

Envelopes Needed

The estimated number of envelopes needed include:
75,190,000 Kraft.
13,940,000 Writing, Sulphite, White and Colored.
255,000 100% Rag Writing, White and Colored.
405,000 100% Rag Ledger, White.
1,890,000 Bond, 50% Rag, White.
441,000 Bond, 100% Rag, White.

Issue Tru-Colour Samples

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., April 22, 1940—Tileston & Hollingsworth have issued their "envelope stuffers" or spring samples of Tru-Colour papers, with illustrations, designed by their own artist, Miss Cornelia Randall, for all kinds of covers, advertising circulars, camp folders and announcements of various kinds. The company issues these papers four times a year, appropriate to each season.

Ajax Paper Co. Shows Movies

BOSTON, Mass., April 22, 1940.—Messrs Mason and Burnett of the Ajax Paper Company Division of the United States Envelope Company, Worcester, Mass., showed two moving picture reels of papers produced at their plant at a sales meeting of Carter Rice & Co., Corp., Saturday morning, which was in charge of John Halkyard, manager of the wrapping paper division of the Carter Rice concern.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for the Week Ending April 24, 1940

	High	Low	Last
A. P. W.	3⅞	3½	3½
Armstrong Cork Co.	41¾	40¾	41¾
Celotex Corp.	10⅞	10⅛	10⅞
Celotex Corp., pf.	70	68½	70
Certain-Teed Products Corp.	7¼	6¼	7⅛
Certain-Teed Products Corp., pf.	33¼	28¾	32⅞
Champion Paper & Fibre Co.	30¾	28	28¾
Champion Paper & Fibre Co., pf.	105¼	104¼	105¼
Congoleum-Nairn Co.	22¾	21¾	22⅛
Container Corp. of America	19½	17	18¾
Continental-Diamond Fibre Co.	8¾	8	8⅛
Crown-Zellerbach Co.	19⅜	17⅜	19
Crown-Zellerbach Co., pf.	94⅞	93½	94
Flintkote Co.	19⅜	18½	18¾
Robert Gair	5¼	4¼	5
Robert Gair, pf.	19¼	16	18½
International Paper & Power	20½	18½	19½
International Paper & Power, pf.	72⅜	66	70¾
Johns-Manville Corp.	70½	67	68¾
Kimberly Clark Corp.	46⅜	43¼	44¾
MacAndrews & Forbes	34⅞	33	33⅞
Masonite Corp.	34	31½	33
Mead Corp.	14¼	13	13⅞
Mead Corp., pf.	71	70	70
Paraffine Companies, Inc.	41⅞	41⅞	41⅞
Rayonier, Inc.	25⅞	22¾	25½
Rayonier, Inc., pf.	34½	32¼	34¼
Ruberoid Co.	19⅝	19	19⅝
Scott Paper Co.	42¼	40½	42¼
Scott Paper Co., pf.	107	106	106
Sutherland Paper Co.	31½	30⅜	30⅜
Union Bag & Paper Corp.	18¾	17⅛	17⅞
United Paperboard Co.	6¾	6	6⅝
U. S. Gypsum Co.	84½	80½	82
U. S. Gypsum Co., pf.	180	178½	178½

New York Curb Exchange

High, Low and Last for the Week Ending April 24, 1940

	High	Low	Last
American Box Board Co.	7¾	6⅞	7¾
Brown Co., pf.	35	31¾	33½
Great Northern Paper	49	47⅜	48½
National Container Corp.	13¼	10¾	12¾
St. Regis Paper Co.	4½	3⅞	4¼
St. Regis Paper Co., pf.	81¼	77½	81¼
Taggart Corp.	5⅜	5¼	5⅜

Canadian International's Sales Up

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 22, 1940—At the annual meeting of the Canadian International Paper Company in Montreal the financial statement presented showed a substantial improvement in operating results, but not to the extent sufficient to cover all charges, including bond interest, depreciation and depletion, etc., the net result after such charges being a loss of $825,703, against a net loss for 1938, after similar charges, of $3,211,343. Balance sheet position showing a substantial improvement, net working capital at $17,854,550 being higher by more than $3 millions.

Sales for 1939 totalled $38,380,616 as compared with $31,614,743. After crediting miscellaneous income and after deducting costs of sales, general expenses, etc., there remained a balance of $5,612,912 available for bond interest before depreciation. Interest on subsidiary and C.I.P. bonds aggregated $3,977,000, being thus covered by a substantial margin before depreciation, which absorbed $1,707,168. In 1938 operating earnings of $3,472,226 fell short of aggregate interest charges by some $750,000 before depreciation.

Directors were elected as follows: R. J. Cullen, New York, N. Y.; Hon. Raoul Dandurand, K.C., P.C., LL.D.; S. L. deCarteret, R. C. Doane, Jas. A. Eccles, Gordon C. Edwards, Ottawa, Ont.; Louis P. Gelinas, John H. Hinman, New York; W. N. Hurlbut, New York; Geo. H. Montgomery, K.C.; John H. Phipps, New York; Chenier Picard, Sherbrooke; Hon. Donat Raymond, Howard P. Robinson, St. John, N.B.; John F. Rollins, New York; T. A. Russell, Toronto; H. R. Weaver, New York; Brig.-Gen. J. B. White, D.S.O., E.D., and A. H. Wiggin, New York.

At the meeting of directors following the annual meeting, officers were elected as follows:

President, John H. Hinman; vice-president and general manager, Samuel L. deCarteret; vice-president and treasurer, Harrison R. Weaver; vice-presidents, E. L. Crooker, R. C. Doane, William N. Hurlbut, F. G. Robinson, C. B. Thorne and Brig.-Gen. J. B. White, D.S.O., E.D.; secretary, Roy Campbell; assistant treasurer, F. A. Laird, and assistant secretary, J. L. G. Brown.

Kimberly-Clark Issues Report

The pamphlet report of the Kimberly-Clark Corporation for 1939, signed by F. J. Sensenbrenner, president, indicates that in 1939 approval was given for the expenditure of $2,395,000 for new construction and that $4,800,000 has been budgeted for major improvements and additions in 1940. The company recently arranged to borrow $3,000,000 of new money, privately, at 3¼ per cent to finance this expansion program.

At the end of 1939 the corporation's total investment in working capital, inventories, buildings and equipment and other assets amounted to $50,975,849, which is equivalent to an investment of $10,230 per employee.

During 1939 the corporation had net sales of $27,861,360 in the United States and Canada, a gain of 4.92 per cent over $26,555,730 net sales in 1938. In terms of basic production the increase was 4.28 per cent.

Payrolls in 1939 were $7,629,601, exclusive of executive salaries, and went to more than 4,950 persons. In 1929 about 2,900 were employed by the company, since which time the standard forty-eight-hour week of the industry has been reduced to a standard thirty-six-hour week.

Container Corp. Nets $509,714

The Container Corporation of America reports for the three-month period ending March 30, 1940, a net profit of $509,714, equal to $.65 per share. Net earnings are after all charges including interest, depreciation, Federal income taxes, and reserves for year end adjustments.

This compares with net earnings of $24,199, or $.03 per share for the corresponding period of 1939.

Gaylord Earns $201,122

The Gaylord Container Corporation and subsidiary for the quarter ended March 31, reports a profit of $201,122 after taxes and charges, equal after preferred dividend requirements to 24 cents a share on 539,221 shares of common stock compared with $123,891 or 11 cents a share in the March quarter a year ago.

CONSTRUCTION NEWS

Fort Worth, Tex.—Plans for a complete fabricating plant of folding cartons and corrugated shipping containers at Ft. Worth, Tex., are announced by Container Corporation of America. J. R. Neil, formerly eastern sales manager, will head up both sales and operations in the new division. Both wet and dry cartons will be manufactured. The company will occupy approximately 100,000 square feet of leased space, expects to employ about 125 people when the entire unit is operating, and estimates its total investment at approximately $250,000.

East Chicago, Ill.—The United States Gypsum Company, 300 West Adams street, Chicago, Ill., manufacturer of wall board and kindred products, has approved plans for new addition to branch plant at Canal street and Riley road, East Chicago, consisting of a one-story structure, 50 x 220 feet, estimated to cost in excess of $75,000, including equipment. Bids have been asked on general erection contract and award will be made soon.

Kingsport, Tenn.—The Tennessee-Eastman Corporation, manufacturer of acetate rayon products, has work in progress on new addition to mill, recently referred to in these columns, designed to provide about 12 per cent increase in present capacity, including acetate cellulose division. Awards are being made for required equipment, including contract to the York Ice Machinery Corporation, York, Pa., for installation of a large absorption refrigeration plant and system, to be used for special processing service. Entire project is reported to cost over $400,000, including equipment.

Chicago, Ill.—The Columbia Paper Stock Company, commercial and other paper products, has arranged for lease of the entire building at 1510 Peoria street, totaling about 35,000 square feet of floor space, and will occupy for new storage and distributing plant, and company headquarters. Work will begin early in May on remodeling and improving the structure, with installation of equipment.

Corning, N. Y.—The Corning Fibre Box Corporation, Hammel street, manufacturer of corrugated paper boxes and containers, has completed plans for new one-story addition to plant. It will be equipped for increased capacity and is estimated to cost close to $50,000, including machinery. Bids have been asked for general erection and work is scheduled to begin soon.

Portland, Conn.—The Robert Gair Company, Inc., 155 East 42nd street, New York, N. Y., manufacturer of corrugated boxes and containers, has awarded general contract to the Bartlett-Brainard Company, 16 Van Dyke avenue, Hartford, Conn., for proposed new branch plant on Airline avenue, Portland, near Middletown, recently referred to in these columns, and will proceed with construction at once. It will be one-story, totaling about 80,000 square feet of floor space, estimated to cost over $150,000, including equipment. Machinery and equipment will be installed for large capacity. Mylchreest & Reynolds, 238 Palm street, Hartford, Conn., are architects and engineers.

Appleton, Wis.—The Riverside Paper Corporation, manufacturer of bond and other paper stocks, has awarded sub-contract for structural steel framing to Bethlehem Steel Company, Milwaukee, Wis., and South Bethlehem, Pa., for proposed new addition to mill at 800 South Lawe street, recently noted in these columns. Work will consist of a top story to present three-story mill unit, 78 x 86 feet, used for finishing department, and will be used for expansion in that division. General erection contract was awarded recently to C. R. Meyer & Sons Company, 50 State street, Oshkosh, Wis. Work is being placed under way.

Benton Harbor, Mich.—The Michigan Mills Paper Company, 92 West Main street, recently organized with capital of 600 shares of stock, no par value, is said to be arranging for early operation of a local mill for the production of a line of paper specialties. Frederick A. Roll, 606 Hill avenue, Glen Ellyn, Ill., is principal incorporator of new company.

Henniker, N. H.—F. E. Norton & Sons, Inc., manufacturer of fiber board products, leather board, etc., plan rebuilding of portion of mill recently destroyed by fire, including power house. Loss estimated over $65,000, including equipment.

Middletown, Ohio—The former plant of the O. K. Paper Pail Company, Richmond street, has been taken over by the General Chemical Company, 40 Rector street, New York, N. Y., manufacturer of liquid alum and allied products, which will improve and occupy for new branch plant.

New York, N. Y.—The National Gypsum Company, East River and 150th street, Bronx, manufacturer of wall board and kindred products, insulating board specialties, etc., has taken out permit for three new one-story additions to local mill, totaling 125 x 675 feet, on Cabot street, near Oak Point avenue, and will proceed with superstructure at once. Cost reported over $200,000, with equipment. This is part of an expansion program now being carried out at this plant, to include a new division for wall board production. Entire project will represent an investment in excess of $1,000,000, with equipment. Main offices are at 190 Delaware avenue, Buffalo, N. Y. J. V. Anderson is company architect for new buildings noted.

Lufkin, Tex.—The Southland Paper Mills, Inc., is planning expansion in local newsprint mill, recently placed in operation, and proposes to arrange financing at early date in amount of about $3,000,000 to build new additions and install equipment to double present capacity from 50,000 to 100,000 tons per annum. It is proposed to have the enlarged mill ready for service in 1941. Plans for present mill were prepared by George F. Hardy, 305 Broadway, New York, N. Y., consulting engineer, who, it is understood, will be in charge of design and construction of proposed extensions. Ernest L. Kurth, president, is head of committee appointed to arrange financing noted.

PAPER
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Henry J. Berger
EDITOR

Vol. 110 April 25, 1940 No. 17

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Olympic Hotel, Seattle, Wash., August 20-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Convention, Netherland Plaza Hotel, Cincinnati, Ohio. June 18-20.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

TREND OF BUSINESS UPWARD

General business activity upon which the volume of paper and its products, as well as many other non-durable goods is more directly influenced, continues to head upward. The leveling off shown in the decline in industry and trade that began last November, continued more slowly through March and the index today is approximately that of March 15 of this year and the level reached on September 1, 1939. The trend of industry and trade this year has been similar to the trend during the last two years. In 1938 and again in 1939, business declined during the first five months of those years, to turn upward in the last half of the year to reach higher levels at the close of the year. From reports at this date it appears that the many business men who hold the expectation that business would follow much the same course this year as in the last two years, is likely to be realized this year.

The substantial rise in business to the high peak of last October and the highest ever reached in paper production, has been leveling off during the first quarter of this year and while the rate of activity is now very nearly that of last Fall, conditions then and now are dissimilar. The demand for consumer goods is substantially higher today than it was last year. Late reports indicate that inventories will not be liquidated to the level of last year and that a new advance is now likely to begin and continue into the third quarter to lift the industrial production index of the Federal Reserve Board to at least 115 next Fall. Last December it rose to 128.

The expectation of a rise in business this year, according to some economists, when under more normal conditions a recession would be likely, is based upon the influx of orders due to the conflict in Europe. The gain in our export trade has been substantial in South America. Exports of paper and paper products for the first two months of 1940 were valued at $8,233,595, compared with $3,813,295 for the first two months of 1939. Exports of paper for February, 1940, were valued at $4,446,950, compared with $1,957,910 for February 1939. Exports of wood pulp for the first two months of 1940 had a value of $2,180,232, compared with $511,539 for January 1939. Exports of wood pulp for February 1940 had a value of $1,327,370, compared with $224,419 for February 1939.

Large volume and small profits are common in the paper industry, as in some other important industries, but the paper container division, which includes liners, chip board, straw board, etc., accounted for 50.7 per cent of production in 1939 and gained 20.9 per cent or 519,000 tons over 1938. Some manufacturers of tin cans are now making paper containers. It is interesting to note that the combined net profit of 42 leading container manufacturers was $60,761,332 in 1939, compared with $42,468,275 in 1938, a gain of 43 per cent, and a decline from 1937 of $13,596,515 or 18.3 per cent. The combined profit of 20 paper manufacturers, producing high and medium grades, tissues and other paper products, was $10,073,003 in 1939, a gain of 228 per cent over $3,072,273 earned in 1938, and a decline from 1937 of $13,973,825 or 28 per cent.

In commenting on business activity for March the *Business Bulletin* published by La Salle Extension University said in part: "Few significant changes have been reported since last month. The spread between the volume of business this year and the rate last year is steading becoming less. The average, however, is still about 4 per cent higher than a year ago. Manufacturing in parts of New England has slowed up somewhat and this change is reflected in the volume of total business transactions. The rate of activity in the New York area is less favorable. Some of this decline may be traced to the smaller amount of speculation in the securities markets. Volume of business in many of the industrial cities around the Great Lakes is from 15 to 20 per cent ahead of last year at this time. Parts of the South Atlantic region and Texas report that business is maintaining a rate of from 10 to 15 per cent above a year ago. Both industrial and agricultural income are responsible for these gains. In the Mountain states and along the Pacific Coast, conditions are about the same as the average throughout the country. The best spots are in the Pacific Northwest and

in Montana. Business in Canada has been forging ahead more rapidly than in the United States. In several industrial cities, volume of trade is 25 per cent or more ahead of last year. The trend continues to be strikingly upward."

March business activity as measured by check payments reported by the Federal Reserve was 7.13 per cent above that of last year. Business in New York was better than this national average, equal to the national average in some states in the Middle West and below the national average in Pennsylvania, Massachusetts and on the Pacific Coast, with the exception of Washington which equalled the national average. Late reports for April are encouraging, despite such factors as the rapid gain in installment buying and a decline in the trend in volume of construction.

Pulp and Paper Study Courses

The excellent facilities generally available for class and correspondence instruction in the manufacture of pulp and paper, particularly prepared for men employed in the industry, is presented in a circular issued April 15 by the Joint Textbook Committee of the Paper Industry, 342 Madison avenue, New York, of which R. S. Kellogg is secretary.

The circular describes in detail the correspondence courses offered by the Institute of Industrial Arts School of Pulp and Paper Making, the Massachusetts Division of University Extension courses, the courses offered by the International Correspondence Schools, college courses, the graduate study offered by the Institute of Paper Chemistry, and the mill courses now available.

In a foreword to all pulp and paper makers the circular states that, "The Joint Textbook Committee has for twenty years provided the basis for a better education of those engaged in this industry. We realize that a course in drawing will not make an architect of a bricklayer, but he will be a vastly better bricklayer if he has learned the principles of the arch and can read a blueprint. So with our industry, study alone will not make a superintendent or manager of a back tender or an acid maker. But we can have better pulp and paper makers and shall have better pulp and paper when all in the industry know the connection between steam pressure and temperature, lignin and cellulose, humidity and evaporation, surface tension and foaming, elastic limit and the life of wires and felts, etc. It is worth while for a workman to be a better pulp or paper maker; it is worth while for a man in any position to qualify himself for a better one."

Japan Imports Rayon Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 24, 1940—Imports of wood pulp from Scandinavian countries into Japan for the period of September through December 1939 totaled approximately 28,275 short tons, of which Finland supplied almost half. A study of the statistics indicates that almost the entire amount of wood pulp imports into Japan during this period was rayon pulp, with only 46 tons being imported for the manufacture of paper.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.6%	77.5%	63.9%	90.3%	76.1%	65.8%	—
February	86.3%	81.7%	68.7%	90.1%	77.9%	70.0%	—
March	84.0%	84.0%	69.6%	90.3%	76.0%	70.5%	—
April	—	82.9%	68.3%	92.1%	82.3%	70.0%	—
May	—	80.2%	69.0%	90.6%	81.6%	69.4%	—
June	—	79.7%	66.0%	87.3%	80.7%	72.3%	—
July	—	75.2%	72.0%	81.8%	77.3%	64.9%	—
August	—	82.9%	77.2%	82.9%	81.5%	70.9%	—
September	—	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	—	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	—	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	—	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	—	84.9%	72.3%	80.6%	81.3%	70.5%	—
First 15 weeks	86.7%	81.4%	67.6%	90.6%	77.6%	68.7%	—

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
March 9	83.5%	March 11	84.2%
March 16	84.7%	March 18	82.3%
March 23	85.1%	March 25	84.1%
March 30	82.7%	April 1	86.2%
April 6	82.0%	April 8	83.7%
*April 13	83.4%	April 15	81.0%

The following statistics show the number of mills reporting by ratio groups:

NUMBER OF MILLS REPORTING—CURRENT WEEKS

Ratio Limits	March 9 1940	March 16 1940	March 23 1940	March 30 1940	April 6 1940	April 13 1940
0% to 50%	64	59	53	49	58	52
51% to 100%	236	240	242	245	220	190
Total Mills Reporting	300	299	295	294	278	242

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	....	....	....	....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	....	....	....	....	....	....

Week end. Mar. 9, 1940—69%
Week end. Mar. 16, 1940—70%
Week end. Mar. 23, 1940—70%
Week end. Mar. 30, 1940—67%
Week end. Apr. 6, 1940—68%
Week end. Apr. 13, 1940—66%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

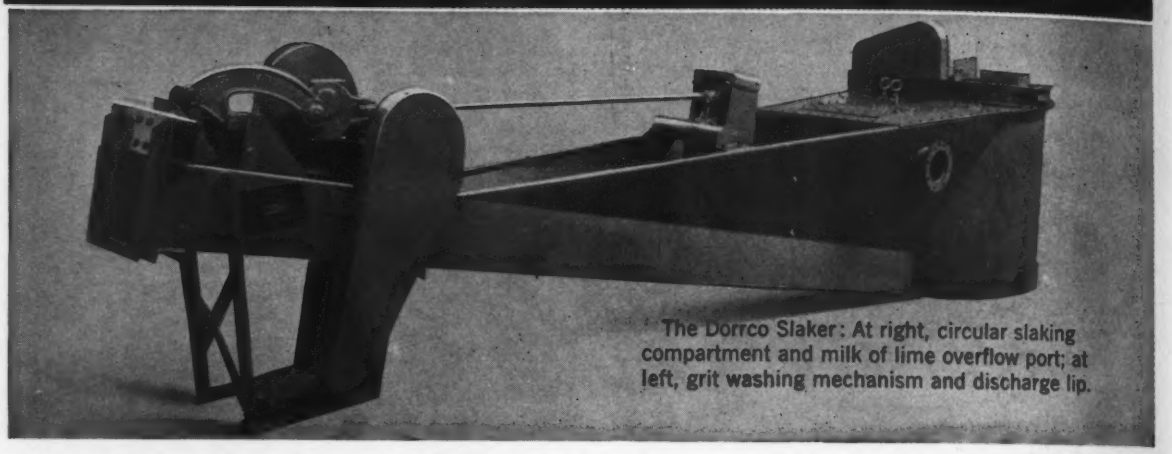
* Preliminary figure.

To Represent L. L. Brown Paper Co.

David J. Crikelair of Los Angeles, Cal., has been appointed Pacific Coast representative of the L. L. Brown Paper Company, Adams, Mass. Mr. Crikelair is well-known in the paper industry on the Coast, where his entire business career has been devoted to the marketing of paper. For a number of years, he was associated with the Los Angeles division of the Zellerbach Paper Company and was also identified with that company in Portland and Phoenix, having served recently as manager of the latter division. His experience also embraces sales work with other Coast paper merchants.

During the World War, Mr. Crikelair enlisted in the Signal Battalion organized in Los Angeles and served with the 316th Field Signal Battalion of the famous 91st Division. He will have his headquarters in Los Angeles but will extend cooperation on L. L. Brown papers throughout the eleven Pacific Coast states.

GRIT FREE MILK OF LIME *for*



The Dorrco Slaker: At right, circular slaking compartment and milk of lime overflow port; at left, grit washing mechanism and discharge lip.

CHEMICAL PULP *and* BLEACHING

View from above

SIZES & CAPACITIES

Dorrco Slakers are supplied in 6 sizes.
Lime (CaO) Capacity—15 to 200 tons per 24 hrs.
Milk of Lime ($Ca(OH)_2$) Capacity—25 to 350 gals. per min.

The **Dorrco Slaker produces continuously a grit-free suspension of milk of lime. It is directly applicable to recausticizing at soda and sulfate mills—to preparing bleach liquor for bleaching all kinds of pulp.**

Two steps are carried out simultaneously—hydration of CaO to $Ca(OH)_2$ in water or weak liquor and the removal, washing and draining of inert material coarser than 100 mesh.

Slaking takes place in a covered and vented circular tank, agitated by a Turbo Mixer. Collection and washing of grit, sand and unburned core is carried out in a long, rectangular compartment, equipped with a Dorr Classifier.

The Dorrco Slaker will produce 98-99 per cent minus 100 mesh milk of lime at dilutions ranging from 5-10 to 1. Washed grit is discharged into containers at 30-35 per cent moisture, virtually free from usable lime—an evidence of excellent hydration.

● ***A note to our nearest office will bring full particulars.***

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ITALY: S.A.I. Dorr-Oliver, Milan • JAPAN: Sanki Eng. Co., Ltd., Tokyo • SCANDINAVIA: A.B. Hedemora, Hedemora, Sweden • AUSTRALIA: Crossle & Duff Pty. Ltd., Melbourne
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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

United States Patents on Papermaking

First Quarter, 1940

Compiled by Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

The following list of patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Since, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; also, it is possible that some patents have been included which do not apply to pulp and paper manufacture.

Copies of any of the following patents may be obtained from the U. S. Patent Office, Washington, D. C., by sending ten cents for each patent desired. The number, name of inventor, and title of the patent should be given in the request. Personal checks and postage stamps are not accepted in payment for patents. Books of coupons may be purchased from the Patent Office for $2.00 or $10.00, good for 20 or 100 patents, respectively. Coupon orders do not have to be accompanied by letters of transmittal.

January 2, 1940

2,185,217. Coating and a method of applying the same to fibrous surfaces. David Pelton Moore, Avon Park, Fla. Filed Dec. 18, 1935. 8 claims. (Cl. 91-68). A process for coating flexible porous sheets which consists in feeding the sheet from a roll in stretched conditions, and distributing simultaneously and from two different sources a finely divided dehydrating and setting calcium compound and an aqueous dispersion of rubber, which gives a uniform waterproof coating congealing into a nontacky condition before the sheet is wound on a take-up roll.

2,185,223. Coating machine. Horace J. Paynter, assignor to American Can Co., New York, N. Y. Filed Nov. 23, 1938. 5 claims. (Cl. 91-51). A doctor for a coating roll which includes a relatively soft material serving as a base for a layer of relatively hard material, so that wearing of the roller-engaging edge of the doctor will leave a keen edge for scraping.

2,185,356. Composite material. Harold F. Robertson, assignor to Union Carbide and Carbon Corp., New York, N. Y. Filed Jan. 25, 1933. 3 claims. (Cl. 154-46). A sheet of fibrous material coated with preformed film of vinyl resin to render it substantially greaseproof and waterproof. The bonding is produced by heating to a temperature below 130 deg. C. at a pressure not more than 250 lb. per sq. in.

2,185,469. Self-sealing wrapper. William Nial MacDonald, assignor to George T. Trumbull, Detroit, Mich. Filed Oct. 19, 1936. 1 claim. (Cl. 229-87). The laps of the wax-coated paper have a multiplicity of registering perforations filled with wax which form wax rivets which bond to one another and to the coating and rivet the laps to each other.

2,185,470. Self-sealing bread wrapper. William N. MacDonald and Walter Noble, Detroit, Mich. Filed Sept. 15, 1937. 6 claims. (Cl. 229-87). A continuous strip of waxed paper or the like having an edge portion of one of its surfaces coated with a nonwax adhesive which is nonadhesive at ordinary temperature but which becomes adhesive under heat and pressure.

2,185,477. Resinous laminated product and method of manufacture. Wesley R. Thompson and William E. Flood, assignors to Catalin Corp. of America. Filed July 23, 1938. 4 claims. (Cl. 154-2). A flexible laminated sheet is produced by impregnating a fibrous sheet with an alcoholic solution of a hardenable phenol formaldehyde resin sol, removing most of the alcohol and heating to convert the hydrophilic sol into a gel *in situ*, pressing the sheets together and heating to harden the gel into a rigid, infusible cellular form which bonds the sheets together.

2,185,567. Emptying apparatus for diffusers, pulp bins, and the like for the manufacture of cellulose and paper. Olaf Qviller, Oslo, Norway. Filed Oct. 27, 1937. 8 claims. (Cl. 92-7). A discharge device for diffusers and the like.

2,185,675. Box blank creasing and folding machine. Herbert L. Mitchell and Seldon G. Mitchell, assignor of 50 per cent to Seldon G. Mitchell and 50 per cent to Charles T. Ingram, both of High Point, N. C. Filed April 24, 1939. 21 claims. (Cl. 93-58.1).

2,185,690. Instrument for measuring light reflectivity. George J. Lane, assignor to Edgar Brothers Co., Metuchen, N. J. Filed June 30, 1938. 4 claims. (Cl. 88-14).

2,185,695. Fireproofing cellulosic fibrous materials. Ralph R. Oliver, assignor to Lockport Cotton Batting Co., Lockport, N. Y. Filed May 1, 1935. 2 claims. (Cl. 91-68). A solution of sodium tetraborate and boric acid of about 7 to 7.4 pH is used for fireproofing loose cotton fibers.

2,185,773. Web guide switch. William C. Nash, Neenah, Wis., assignor of one-fifth each to Mary Jones, Marie Duvall, William M. Nash, and Roy A. Nash. Filed Jan. 11, 1937. 2 claims. (Cl. 200-52). A feeler mechanism for a web guide.

2,185,776. Method of treating wood cellulose. Lyle Melvin Sheldon, Lionel Elmer Goff, Milton L. Herzog, and Fredrich Olsen, assignors to Cellulose Research Corp., East Alton, Ill. Filed May 26, 1936. 9 claims. (Cl. 8-105). A method of producing a purified wood pulp having a viscosity above a predetermined minimum which comprises treating a sulphite pulp with Cl, dilute NaOH at an elevated temperature, a hypochlorite solution of not more than 3 per cent at a temperature of 20 to 35 deg. C. at a pH not less than 8 for not more than 4 hr., boiling in a nonmercerizing NaOH solution and mercerizating the pulp.

2,185,785. Sedimentation process and apparatus. John V. N. Dorr, William C. Weber, George M. Darby and Elliott J. Roberts, assignors to Dorr Co. Inc., New York, N. Y. Filed June 8, 1935. 7 claims. (Cl. 210-55). A method of separating suspended solids from liquids by concomitant flocculation and sedimentation within a single tank.

2,185,859. Method of coating paper. Peter Jay Massey, River Forest, Ill. Filed Nov. 14, 1938. 7 claims. (Cl. 91-68). An etched roll is used for carrying a free flowing suspension, the excess of the surfacing material is removed with a doctor, leaving a continuous film of predetermined uniform average thickness and applying this film to the surface of a web under pressure.

2,185,884. Guide construction for corrugating machines. Hobart W. Bruker and Charles S. Thorn, assignors to George W. Swift Jr. Inc., Bordentown, N. J. Filed June 18, 1938. 4 claims. (Cl. 154-30).

2,185,885. Cutting mechanism. Hobart W. Bruker and Harry F. Black, assignors to George W. Swift Jr. Inc., Bordentown, N. J. Filed Sept. 13, 1938. 7 claims. (Cl. 164-60). A rotary slotting blade, spaced rotary die members and stationary pressure members.

2,185,913. Papermaking machine. George J. Forman, Montville, Conn. Filed July 19, 1935. 1 claim. (Cl. 92-44). A Fourdrinier machine on which board can be produced and on which two or more stocks of paper can be run side by side.

2,185,954. Impregnation of paper or other materials, more especially for the protection of vegetable and animal goods during storage. Arthur Ryner, assignor to Preservators Ltd., London, England. Filed Sept. 29, 1937. 11 claims. (Cl. 91-68). Paper is impregnated with a complex compound of a metal with ammonia and an acid radical which evolved ammonia when subjected to the action of CO_2.

2,185,962. Digester apparatus. James Fletcher, assignor to Babcock & Wilcox Co., Newark, N. J. Filed Jan. 23, 1937. 11 claims. (Cl. 214-17). A chip distributing mechanism for digesters, including a hopper, a rotatable chip feeder in the hopper and a tiltable feed regulator.

2,185,983. Decalcomania. Ferdinand W. Humphner, assignor to Mid-States Gummed Paper Co., Chicago, Ill. Filed Dec. 29, 1938. 11 claims. (Cl. 41-33). A plurality of paper sheets, colored adhesive between the sheets, adhesive over one of the sheets, a transfer body over the last-mentioned adhesive and an imprint on the body.

January 9, 1940

2,186,001. Flexible abrasive sheet material. Howard G. Bartling, assignor to Minnesota Mining & Mfg. Co., St. Paul, Minn. Filed Jan. 20, 1930. 16 claims. (Cl. 57-185). A layer of material which is hygroscopic and immiscible with the adhesive bonding material is placed between the non-metallic flexible backing material and the adhesive bonding material.

2,186,034. Pulp bleaching and refining process. Harold R. Murdock, assignor to Champion Paper and Fibre Co., Canton, N. C. Filed Aug. 24, 1937. 4 claims. (Cl. 92-16). Pulp is treated with chlorine so as to chlorinate the lignin content, washed with dilute caustic alkali, beaten to a certain degree, treated with hypochlorite, and then mechanically hydrated.

2,186,040. Composition of matter and process of preparing the same. Joseph E. Plumstead, assignor to Raffold Process Corp., Andover, Mass. Filed Sept. 29, 1934. 12 claims. (Cl. 134-58). An alkaline earth metal carbonate is treated with an acidic material (one containing a sulphite radical) to form water-insoluble opaque alkaline pigment particles having corroded surfaces.

2,186,073. Container and means for and method of making containers. Ogden Johnson, assignor to American Sealcone Corp., New York, N. Y. Filed June 24, 1938. 36 claims. (Cl. 93-39.1).

2,186,095. Pigment process. James E. Booge and Charles F. Oppermann, assignors to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Aug. 11, 1937. 7 claims. (Cl. 134-78). A small amount of an alkali metal pyrophosphate is added to zinc sulphide.

2,186,124. Laminated structure and method for making the same. John Webb Rash, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Sept. 12, 1936. 6 claims. (Cl. 154-40). The base material is treated with a thin film of a nitrocellulose ink, a film containing polymerized isobutylene and rosin, and finally a layer of filled, uncured rubber composition.

2,186,134. Preservative composition. Alfred Dale Chapman and Ralph Melvin Lindgren, assignors to A. D. Chapman & Co., Inc., Chicago, Ill. Filed July 7, 1938. 1 claim. (Cl. 134-78.6). Cellulose material may be protected from decay, stain, and mold fungi, and insects by treating with a solution of alkali metal salts of tetrachlorophenol or pentachlorophenol and an alkali metal borate.

2,186,136. Paper clamp. Walter C. Eickman, assignor to Harris-Seybold-Potter Co., Cleveland, Ohio. Filed March 26, 1935. 21 claims. (Cl. 164-54). A clamp for a paper-cutting machine.

2,186,171. Papermaking machine. William Hulse Millspaugh, assignor to Sandusky Foundry and Machine Co., Sandusky, Ohio. Filed June 19, 1936. 2 claims. (Cl. 92-49). A first press with a lower suction roll and an upper smooth-surfaced pressure roll, the suction roll having an upper suction box adjacent the bottom of the pressure roll; an endless felt travels forward between the wire and the suction roll and is so arranged between the two rolls as to pre-

sent the wire side of the paper directly to the smooth-surfaced roll.

2,186,213. Device for testing the rupturing strength of sheet material. Samuel N. Senna, assignor to B. F. Perkins & Son Inc., Chicopee, Mass. Filed Aug. 10, 1935. 9 claims. (Cl. 265-14). A type of Mullen tester.

2,186,262. Composition and method for preparing same. James A. Mitchell, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed May 31, 1935. 4 claims. (Cl. 106-40). A cellulose composition for producing moistureproof articles comprising cellulose nitrate, a wax, and a plasticizer of the formula R' 'SO_2NRR'.

2,186,295. Process of manufacturing tall oil-free pulp from southern pine. Torsten Hasselstrom, New York, N. Y. Filed Oct. 30, 1936. 8 claims. (Cl. 92-20). A method of washing pulp containing more than about 1 per cent of tall oil on a screen and of recovering the tall oil.

2,186,453. Recovery of sulphur dioxide. George H. Gleason and Alfred C. Loonam, assignors to Guggenheim Brothers, New York, N. Y. Filed Jan. 17, 1938. 4 claims. (Cl. 23-178). Dimethylaniline is used as a scrubbing medium; the SO_2 is liberated by heat.

2,186,487. Bleaching pulp. Herman L. Joachim, assignor to Maui Agricultural Co. Ltd., a corporation of the Territory of Hawaii. Filed Sept. 22, 1938. 6 claims. (Cl. 8-105). Bagasse pulp is treated with free chlorine (62.5 to 67.5 per cent of the total chlorine demand) at a temperature below 80 deg. F., washed, treated with an alkaline liquor, washed, treated with an acid hypochlorite solution, alkalized during the bleaching, washed, and then treated with a strong caustic solution, with a final washing.

2,186,511. Wallboard. Floyd D. Welch, Shreveport, La. Filed Sept. 23, 1937. 5 claims. (Cl. 20-4). A wallboard having a plurality of air chambers having an opening at the outer face of the wallboard.

2,186,609. Method of removing wax from waxed paper stock. Otto Kress, assignor to The Institute of Paper Chemistry, Appleton, Wis. Filed May 5, 1937. 10 claims. (Cl. 92-3). The stock is defibered in an aqueous medium and treated with a water-soluble emulsifying agent and an alkali solution of a water-insoluble, alkali-soluble, acid-precipitable protein; agitation gives a stable emulsion of the waxy materials.

2,186,679. Calender roll. Archibald C. Lade, assignor to B. F. Perkins & Son Inc., Holyoke, Mass. Filed March 18, 1937. 1 claim. (Cl. 92-77). A rigid, central shaft, disk-like members formed of fibrous material and having their outer peripheral portions impregnated with hardened plastic material.

2,186,709. Cellulose product. Ben W. Rowland, assignor to Institute of Paper Chemistry, Appleton, Wis. Filed Aug. 21, 1936. 3 claims. (Cl. 92-21). An absorbent paper product comprising rosin-alum sized fibers having incorporated therein an oil emulsion of a phospholipoid (lecithin).

2,186,761. Papermaking machine. Bernard A. Malkin, assignor to Dominion Engineering Works, Ltd., Lachine, Quebec, Canada. Filed Oct. 8, 1936. 5 claims. (Cl. 92-44). A pond chamber of vertical depth with means for supplying stock through inlet so that stock tends to rise to a level above outlet and means for introducing compressed air for controlling depth and velocity of stock immediately behind the outlet opening.

2,186,772. Boxmaking machine. Clayton Straw, assignor to Kingsbury & Davis Machine Co., Contoocook, N. H. Filed April 13, 1938. 13 claims. (Cl. 93-41).

2,186,810. Safety paper and method of making same. Francis L. Simons, assignor to George La Monte & Son, Nutley, N. J. Filed June 20, 1936. 15 claims. (Cl. 91-67.95). The paper contains a compound containing the grouping N—C—C—N.

2,186,874. Paper manufacture. James O. Mason, assignor to K-C-M Co., Dayton, Ohio. Filed July 6, 1938. 6 claims. (Cl. 92-40). A method of incorporating a filler on the wire side of a sheet, producing a balance of receptive conditions of the opposite sides of the sheet with the wire side comparable with the top side, drying the paper and then coating on both sides.

2,186,884. Web cutting mechanism. Wesley P. Shomaker, Richmond, Va. Filed June 22, 1938. 2 claims. (Cl. 164-43).

2,186,893. Disintegration of vegetable fibrous materials. Alfons Payerl, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. Filed May 7, 1937. 5 claims. (Cl. 92-9). A method of impregnating wood with nitric acid under five atmospheres' pressure at a temperature of 40 to 50 deg. C., adding hot water and pulping at 70 to 95 deg. C.

2,186,901. Foldermaking machine. Gustav Ewald and Burns T. McGary, assignors to Remington Rand, Inc., Buffalo, N. Y. Filed May 1, 1937. 24 claims. (Cl. 93-1). A machine for making W-type folders.

2,186,957. Coating method. William R. Collings and John J. Hoeltzel, assignors to Dow Chemical Co., Midland, Mich. Filed April 13, 1938. 1 claim. (Cl. 91-68). Coating embossed paper by spreading a layer of cellulose derivative solution upon a horizontally moving flat sheet of embossed cover stock and immediately subjecting the embossed sheet to suction applied to the under surface thereof, whereby there is produced a uniformly coated, nonwarping paper having a uniform high gloss.

2,186,977. Boxmaking. Cutler D. Knowlton, assignor to Hoague-Sprague Corp., Lynn, Mass. Filed July 13, 1937. 50 claims. (Cl. 93-49). A machine for operating upon blanks having side wings and corner laps.

2,187,005. Method of making shoe stiffeners. Richard Almy, assignor to Armstrong Cork Co., Lancaster, Pa. Filed Dec. 2, 1935. 3 claims. (Cl. 91-68). Method of making shoe stiffeners by impregnating a fibrous web with a water emulsion of minute drops of a solution of cellulose ester.

2,187,016. Process of treating ground wood. Kenneth A. Craig, assignor to Paper Patents Co., Neenah, Wis. Filed April 19, 1939. 10 claims. (Cl. 8-104). Groundwood is treated with an alkaline peroxide bath and then with an acid sulphite bath.

2,187,050. Process for producing titanium pigments. Gordon D. Patterson, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed April 23, 1937. 10 claims. (Cl. 134-58). A calcined titanium pigment is mixed with from 0.1 to 10 per cent of a hydrated aluminum oxide.

2,187,130. Treated pigment and process for producing the same. Albert Lightbody, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed April 24, 1937. 6 claims. (Cl. 134-78). A zinc sulphide pigment is treated with a minor quantity of a metallic thiocyanate, thiosulphate, or xanthate to render it stain-resistant.

2,187,211. Paper slitter. David R. McKinley and Peter J. Van Norden, Kalamazoo, Mich. Filed June 12, 1939. 6 claims. (Cl. 164-60).

2,187,294. Process for stiffening paper. Clare G. Young, Winnipeg, Manitoba, Canada. Filed January 31, 1938. 1 claim. (Cl. 18-56). In the manufacture of convex Venetian blind slats, strips of paper are soaked in an aqueous solution of glue and afterwards placed upon a cardboard slat covered with paraffin wax.

2,187,330. Chip packer and spreader for pulp mills. Claus K. A. Rudd, Everett, Wash. Filed March 30, 1938. 2 claims. (Cl. 214-17). A chip distributor for pulp digesters.

2,187,335. Composite board. Henry D. Wagner, assignor to Hinde & Dauch Paper Co., Sandusky, Ohio. Filed May 6, 1937. 2 claims. (Cl. 154-45). An insulating panel.

2,187,366. Manufacture of vanillin. Leo Schulz, assignor to Schimmel & Co. A. G., Miltitz, near Leipzig, Germany. Filed Dec. 15, 1937. 11 claims. (Cl. 260-600). A method of oxidizing lignin to vanillin by an aromatic nitro compound.

2,187,417. Tea bag, coffee bag, and the like. Ralph N. Doble, Hingham, Mass. Filed Dec. 30, 1938. 3 claims. (Cl. 99-77.1). A paper bag is used.

2,187,504. Fused jordan lining and process of making. Harold D. Stuck, assignor to John W. Bolton & Sons, Inc., Lawrence, Mass. Filed Feb. 4, 1935. 6 claims. (Cl. 92-27). A shell lining is formed by fastening the knives to a flat backing and then rolling up the backing and the knives.

2,187,710. Wood cellulose and method of producing same. Lionel Elmer Goff, Lyle Melvin Sheldon, Milton Lawrence Herzog, and Fredrich Olsen, assignors to Cellulose Research Corp., East Alton, Ill. Filed May 26, 1936. 3 claims. (Cl. 260-229). A method of bleaching a pulp from a mild acid sulphite digestion with chlorine and hypochlorite and then treating with acetic acid to increase the reactivity of the cellulose for acetylation.

January 23, 1940

2,187,827. Paper cutter. Walter C. Eickman, assignor to Harris-Seybold-Potter Co., Cleveland, Ohio. Filed Dec. 15, 1937. 18 claims. (Cl. 164-59).

2,187,858. Method of producing impregnating compositions. Rudolf Kern, assignor to the firm Chemische Fabrik R. Baumheier Kommanditgesellschaft, Oschatz-Zschollau, Germany. Filed April 15, 1936. 3 claims. (Cl. 134-15). A waterproofing composition composed of glue, a semi-drying fatty acid, a metallic formate, paraffin, paraffin oil, and montan wax.

2,187,918. Drying die for fibrous articles. Edward C. Sloan, assignor to Jesse B. Hawley, Geneva, Ill. Filed March 28, 1936. 3 claims. (Cl. 92-59).

2,188,064. Mechanism for making laminated products. David C. Spaulding Jr., assignor to Standard Oil Co., Cleveland, Ohio. Filed Sept. 24, 1937. 22 claims. (Cl. 93-81). A method for laminating paper webs with adhesives.

2,188,204. Bituminous mixture. Henri Marc and Harold W. Greider, assignor to Philip Carey Manufacturing Co., Cincinnati, Ohio. Filed Jan. 24, 1936. 7 claims. (Cl. 134-51). An asphalt, a petroleum solvent, dipentene, and one to ten per cent resin from cumene and indene, giving a solution in which the bituminous base does not liver or become gelatinized.

2,188,220. Apparatus for concentrating solutions, particularly black liquors. Carl Thomas Carlson, Alsten, Sweden. Filed Aug. 21, 1936. 12 claims. (Cl. 159-9).

2,188,282. Wrapper mechanism. Clarence J. Malhiot, assignor to F. B. Redington Co., Chicago, Ill. Filed July 5, 1938. 4 claims. (Cl. 164-68).

January 30, 1940

2,188,321. Production of acid for sulphite pulping process. Walter H. Swanson, Lloyd Lang, and Donald C. Porter, assignors to Paper Patents Co., Neenah, Wis. Filed July 22, 1937. 4 claims. (Cl. 23-132). Cooled sulphur burner gas is passed through a dissolving chamber countercurrent to the flow of cooled water, the flow of water being so regulated that it will dissolve only that portion of sulphur dioxide to be used to produce the free sulphur dioxide component of the sulphite acid.

2,188,329. Gummed tape manufacture. Hans F. Bauer, Jordan V. Bauer, and Don M. Hawley, assignors to Stein, Hall Mfg. Co., Chicago, Ill. Filed Dec. 22, 1938. 12 claims. (Cl. 91-68). The adhesive consists of a root starch conversion starch with a dextrin content less than about 55 per cent, 3 to 30 per cent of urea, 1 to 5 per cent of borax and 1 to 10 per cent of glycerine.

2,188,331. Paper-carrier sheet for tacky rubber and process of making same. George W. Coggeshall, assignor to S. D. Warren Co., Boston, Mass. Filed July 16, 1936. 9 claims. (Cl. 91-68). A strong, tough, nonsplitting, nonadhesive paper sheet having properties adapted for use as a carrier for tacky rubber in the rubber industry.

2,188,332. Flexible coated article. Wallace H. Carothers, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Feb. 15, 1937. 11 claims. (Cl. 91-68). A flexible fabric base and a synthetic linear condensation product, capable of being formed into fibers showing orientation along the fiber axis.

2,188,341. Process for the manufacture of abrasive articles. Ernst Elbel and Fritz Seebach, assignors to Behr-Manning Corp., Troy, N. Y. Filed Dec. 24, 1931. 11 claims. (Cl. 51-280). The binder consists of a phenolaldehyde resin brought into homogeneous solution with a drying oil.

2,188,484. Cylinder paper making machine. Guy M. Peterson, assignor to Cheney Bigelow Wire Works, Springfield, Mass. Filed May 6, 1937. 3 claims. (Cl. 92-43).

2,188,494. Filler and method of making same. Harold E. Bode, assignor to Corn Products Refining Co., New York, N. Y. Filed Sept. 20, 1937. 5 claims. (Cl. 134-11). A filler comprising a water-insoluble starch having chemically deposited on each granule a water-insoluble salt of an alkaline earth metal.

2,188,533. Process of making felt. Pierre Drewsen, assignor to Barrett Co., New York, N. Y. Filed Nov. 16, 1935. 4 claims. (Cl. 92-6). Straw is disintegrated with NaOH and sodium carbonate, the pulp is felted and impregnated with a waterproofing material.

2,188,663. Process of making fine particle alkaline earth metal carbonates. Raymond R. McClure and John Pierre Seguin, assignors to Diamond Alkali Co., Pittsburgh, Pa. Filed April 4, 1938. 10 claims. (Cl. 23-66). Alkaline earth metal hydroxide solutions containing a monosaccharide, disaccharide, or polyhydroxy alcohols are treated with CO_2, giving carbonates of fine particle size.

2,188,759. Box covering machine. William Russell Redd, assignor to Wm. Wrigley, Jr. Co., Chicago, Ill. Filed Sept. 23, 1938. 8 claims. (Cl. 93-55).

February 6, 1940

2,188,895. Stable zein solution. Roy E. Coleman, assignor to Zein Corp. of America, Chicago, Ill. Filed Aug. 9, 1937. 2 claims. (Cl. 134-12). A solution of zein in ethylene glycol.

2,188,900. Light sensitive paper and sensitizing composition therefore. Gustav A. Hinkel, assignor to B. K. Elliott Co., Pittsburgh, Pa. Filed Feb. 20, 1939. 24 claims. (Cl. 95-6). A blueprint paper composition containing a ferric alkali metal salt of an organic acid, and alkali metal ferrocyanide and a hydroxyalkylamine salt of a polybasic acid.

2,188,916. Method of making container parts. John H. Murch, assignor to American Can Co., New York, N. Y. Filed June 9, 1938. 8 claims. (Cl. 93-360).

2,188,994. Apparatus for automatically making and assembling filing cards. Alfred H. Anderson, Jason A. Fitch, and Clarence W. Straubel, assignors to acme Visible Records Inc., Chicago, Ill. Filed Nov. 18, 1938. 16 claims. (Cl. 164-49).

2,189,042. Sheet-severing mechanism. Michael Maul. Assignor to the firm Deutsche Hollerith Maschinen Gesellschaft m.b.H., Berlin-Lichterfelde, Germany. Filed Aug. 9, 1938. 6 claims. (Cl. 164-49).

2,189,069. Sealing mechanism for wrapping machines. Thormod Jensen, assignor to American Machine & Foundry Co., Brooklyn, N. Y. Filed Aug. 28, 1937. 2 claims. (Cl. 93-2).

2,189,087. Continuous motion wrapping machine. Elmer L. Smith and Carlton Wetsel, assignors to Package Machinery Co., Springfield,

Mass. Filed July 28, 1936. 7 claims. (Cl. 93-2).

2,189,105. Box-forming machine. Benjamin Evans and Henry L. Metzger, assignors to Fort Orange Paper Co., Castleton on Hudson, N. Y. Filed Sept. 2, 1938. 31 claims. (Cl. 93-51).

2,189,132. Process for producing phenol-cellulose resin. Leon E. Champer and Leo M. Christensen, assignors to Chemical Foundation Inc., New York, N. Y. Filed April 13, 1937. 1 claim. (Cl. 260-10). Phenol and cellulose with 1 to 5 per cent of HCl are heated from 60 to 80 deg. C. for 4 days.

2,189,133. Phenol-cellulose resin. Leon E. Champer and Leo M. Christensen, assignors to Chemical Foundation Inc., New York, N. Y. Filed April 13, 1937. 3 claims. (Cl. 260-10). Phenol and cellulose are heated at 60 to 80 deg. C. with 1 per cent HCl and up to 5 per cent of an active reducing agent for 4 days.

2,189,347. Machine for forming packages. William T. Martin, assignor to Beech-Nut Packing Co., Canajoharie, N. Y. Filed April 8, 1937. 8 claims. (Cl. 93-2).

2,189,352. Process and device for the determination and regulation of the moisture content of lengths of material. Max Siegenheim, assignor to the firm M. Rudolf Jahr, Gera, Germany. Filed Nov. 9, 1937. 6 claims. (Cl. 175-183). An electrical conductivity method.

2,189,378. Bleaching fibers and a composition therefore. Hans O. Kauffmann, assignor to Buffalo Electro-Chemical Co. Inc., Buffalo, N. Y. Filed Feb. 5, 1938. 11 claims. (Cl. 8-111). An alkaline H_2O_2 solution is used.

2,189,409. Laminated sheet material. Leon T. Sibley, assignor to Alfol Insulation Co. Inc., a corporation of Delaware. Filed Nov. 20, 1937. 3 claims. (Cl. 154-44). A foil-covered, reinforced, laminated sheet material.

2,189,431. Method of making impervious bags. George Arlington Moore, assignor to Humoco Corp., Louisville, Ky. Filed May 27, 1936. 3 claims. (Cl. 93-35).

2,189,518. Papermaking machinery. Ernst Gschwender and William C. Bigelow, assignors to Detroit Sulphite Pulp & Paper Co., Detroit, Mich. Filed March 14, 1938. 12 claims. (Cl. 92-43). A pulp vat for a rotary cylinder machine.

2,189,562. Toilet seat cover and method of forming same. Grover Doerr, near Brownstown, Ind. Filed Feb. 10, 1939. 4 claims. (Cl. 93-1).

2,189,589. Apparatus for testing materials. Everett A. Mahannah and Harold P. Bailey, assignors to International Paper Co., New York, N. Y. Filed Jan. 19, 1937. 10 claims. (Cl. 73-51). An abrasive element rotatably mounted on a support for abrading the surface of the material to be tested.

2,189,729. Packet making and filling machine. Harry L. Evans, Newport, R. I., and George I. Hohl, Brooklyn, N. Y. Filed Nov. 20, 1937. 25 claims. (Cl. 93-3).

2,189,738. Film smoother. Bert C. Miller, assignor to Bert C. Miller Inc., New York, N. Y. Filed Aug. 7, 1937. 4 claims. (Cl. 91-53).

February 13, 1940

2,189,832. Paper manufacture. Harold R. Rafton, assignor to Raffold Process Corp., Andover, Mass. Filed Oct. 15, 1936. 5 claims. (Cl. 92-21). A calcium carbonate filler is used.

2,190,018. Impregnated electric insulation for electric cables. William A. Del Mar, assignor to Phelps-Dodge Copper Products Corp., Dover, Del. Filed Aug. 22, 1939. 4 claims. (Cl. 154-2.6). A paper is impregnated with oil containing in solution from 5 to 20 per cent of hydrogenated wood rosin.

2,190,034. Method of making waterproof sheets or boards. Harold L. Levin, assignor to Patent and Licensing Corp., New York, N. Y. Filed Jan. 30, 1931. 2 claims. (Cl. 92-21). The method of mixing with asphalt an absorbent inorganic material, such as bentonite, to render the asphalt more friable and dispersing the mass in the paper stock.

2,190,193. Chemical wood-pulping process. George A. Richter, assignor to Brown Co., Berlin, N. H. Filed Jan. 31, 1936. 6 claims. (Cl. 92-13). The chips in the digester are just covered with NaOH liquor but circulatory communication is maintained between the digester and a large reservoir of similar liquor outside so that there will be 0.3 to 0.6 lb. of sodium oxide equivalent per lb.

2,190,194. Chemical pulping of raw cellulosic material. George A. Richter, assignor to Brown Co., Berlin, N. H. Filed Oct. 28, 1936. 7 claims. (Cl. 92-11). Chips containing not more than 50 per cent of moisture are impregnated with SO_2 and then with a gaseous oxidizing agent to oxidize the SO_2 *in situ* to H_2SO_4, finally cooking such material in chemical pulping liquor.

2,190,210. Decalcomania and method of preparing same. Joseph W. Kaber, Shaker Heights, Ohio. Filed Nov. 23, 1937. 13 claims. (Cl. 41-33). The design is applied to an adhesive coated paper having a coating of cellulose lacquer.

2,190,274. Method of bleaching cellulose. Lyle Melvin Sheldon, assignor to Cellulose Research Corp., East Alton, Ill. Filed Nov. 28, 1936. 2 claims. (Cl. 8-105). A method in which hypochlorite is used at a pH greater than 7.

2,190,372. Manufacture of adhesives. Julius R. Adams, assignor to Old Colony Envelope Co., Westfield, Mass. Filed Aug. 18, 1937. 8 claims. (Cl. 134-23.4). A remoistening adhesive consisting of dextrin, a water-soluble ether, sorbitol, and methylsalicylate.

2,190,405. Decalcomania. Ferdinand W. Humphner, assignor to Mid-States Gummed Paper Co., Chicago, Ill. Filed July 25, 1938. 11 claims. (Cl. 41-33). A heat-responsive decalcomania comprising a rosin-sized paper and a rosin imprint thereon.

2,190,479. Method and means for making containers. George Arlington Moore, assignor to Humoco Corp., Louisville, Ky. Filed Aug. 16, 1938. 13 claims. (Cl. 93-36).

2,190,612. Production of bisulphite liquor. Ralph W. Shafor and Robert P. Kite, assignors to Dorr Co. Inc., New York, N. Y. Filed June 1, 1936. 1 claim. (Cl. 23-130). Method of creating finely-divided limestone with SO_2 gas.

February 20, 1940

R21,360. Manufacture of papermaker's wire cloth. Willie Dunstan Theodore Green, assignor to United Wire Works Ltd., Granton, Edinburgh, Scotland. Original no. 2,143,552, dated Jan. 10, 1939. Application for reissue Nov. 22, 1939. 3 claims. (Cl. 245-8).

2,190,660. "Sulphate black liquor" tall oil rosin and process of making the same. Torsten Hasselstrom, New York, N. Y. Filed Jan. 8, 1935. 4 claims. (Cl. 260-107). A method of reacting crude tall oil soap with an acid, separating the liquid portion and crystallizing the residue, giving a solid rosin.

2,190,680. Process of producng corrugated papers. William Wallace Rowe, assignor to Paper Service Co., Lockland, Ohio. Filed Aug. 5, 1935. 11 claims. (Cl. 154-33).

2,190,711. Sheet insulation material. Carl F. Hanson, assignor to Irvington Varnish & Insulator Co., Irvington, N. J. Filed March 16, 1938. 4 claims. (Cl. 154-2.6). A sheet of crinkled paper with a coating of elastic insulating varnish on at least one face.

2,190,766. Tape gumming apparatus. Arthur Bennett, San Francisco, Cal. Filed Nov. 18, 1936. 3 claims. (Cl. 91-43).

2,190,809. Fabricator for adhesive tape. Clauss Burkart Strauch, assignor to Minnesota Mining & Mfg. Co., St. Paul, Minn. Filed May 18, 1936. 9 claims. (Cl. 91-43).

2,190,843. Method of coating paper. Bert C. Miller, assignor to Bert C. Miller Inc., New York, N. Y. Filed March 20, 1934. 6 claims. (Cl. 91-70). A synthetic resin is used to provide a highly polished thin flexible surface film firmly attached to a paper base free from impregnation.

2,190,851. Paper machinery. Stephen A. Staege, assignor to Black-Clawson Co., Hamilton, Ohio. Filed Sept. 5, 1936. 5 claims. (Cl. 34-48). A roll drive for drier rolls in which the drive is operated by spur gears.

2,190,909. Process for making fibrous molded products and materials. Max Phillips and Marshall J. Goss, dedicated to the free use of the People of the United States of America. Filed June 7, 1938. 6 claims. (Cl. 106-40). Lignin in a lignin-containing material is activated by heating with alcohol and an acid catalyst, the alcohol is removed and the resulting material is hardened by pressure.

2,190,941. Paper calendering apparatus. Delbert G. Gardner, assignor to Great Northern Paper Co., Millinocket, Me. Filed July 23, 1937. 2 claims. (Cl. 92-74). A method for threading paper from the drier into and through the calender.

2,191,052. Save-all. Arsenio R. Velasco and William Wyllie, Talisay, Occidental Negros, P. I. Filed Oct. 21, 1938. 1 claim. (Cl. 159-31).

2,191,144. Press roll. Lloyd Hornbostel, assignor to Beloit Iron Works, Beloit, Wis. Filed Dec. 31, 1937. 4 claims. (Cl. 92-49). A plurality of rolls in peripheral pressure relation, each roll being crowned to offset against deflection.

2,191,149. Means for applying match ignition material to book matches, etc. Charles F. Wright, assignor to Diamond Match Co., New York, N. Y. Filed Nov. 29, 1938. 10 claims. (Cl. 91-50).

2,191,197. Method of making bottle carriers. Harry Z. Gray, Lebanon, Ohio. Filed June 2, 1939. 5 claims. (Cl. 93-1).

2,191,225. Paste applying apparatus. Almeron Allan Beach, Hobart, N. Y. Filed April 30, 1938. 2 claims. (Cl. 91-33).

2,191,330. Boxmaking machine. Clayton Straw, assignor to Kingsbury & Davis Machine Co., Contoocook, N. H. Filed Jan. 21, 1939. 9 claims. (Cl. 271-45).

2,191,467. Apparatus for producing calcium sulphite. Gerald Haywood, assignor to West Virginia Pulp & Paper Co., New York, N. Y. Filed March 18, 1936. 7 claims. (Cl. 23-260). A plurality of absorption chambers and tanks for preparing calcium sulphite from lime and sulphur dioxide.

2,191,496. Machinery for making window envelopes. Abraham Novick, assignor to F. L. Smithe Machine Co. Inc., New York, N. Y. Filed Aug. 29, 1934. 10 claims. (Cl. 93-61).

2,191,497. Method of and apparatus for making bags and the like. Adolph Potdevin and Paul Hunziker, assignors to Potdevin Machine Co., Brooklyn, N. Y. Filed Jan. 6, 1937. 11 claims. (Cl. 164-68).

2,191,505. Manufacture of window envelopes. Ferdinand L. Smithe and Abraham Novick, assignors to F. L. Smithe Machine Co. Inc., New York, N. Y. Filed July 13, 1934. 14 claims. (Cl. 271-1).

2,191,525. Preparation of cellulose derivatives. Joseph Fleischer and William A. Bailey, Jr., assignors to Cellulose Research Corp., East Alton, Ill. Filed May 5, 1937. 7 claims. (Cl. 260-227). Conditioning cellulose for chemical treatment by providing purified cellulose with its fibers in swollen condition and saturated with water and distilling with a low molecular weight fatty acid and of an organic solvent.

2,191,530. Coating composition. Robert Tyler Hucks, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed April 5, 1938. 7 claims. (Cl. 260-16). A nonbronzing maroon cellulose nitrate coating composition.

2,191,575. Paper filler and method of making the same. Howard D. Meincke, Glencoe, Ill. Filed June 23, 1938. 6 claims. (Cl. 134-18). Increasing the retention of a nonsetting paper filler by agitating a gypsum cement in water in the presence of a nonsetting filler.

2,191,731. Stencil sheet. Walter O. Snelling, assignor to Trojan Powder Co., Allentown, Pa. Filed July 2, 1938. 3 claims. (Cl. 41-38.6). A fibrous base coated with nitro starch and a tempering agent.

2,191,947. Coating compositions. Edward R. Allen, James B. Bullitt, Jr., and Horace H. Hopkins, assignors to E. I. du Pont de Nemours Co., Wilmington, Del. Filed Jan. 7, 1936. 10 claims. (Cl. 260-40). A coating composition resistant to yellowing which comprises an oil modified polyhydric alcohol-polybasic acid resin and a titanium pigment, a blue tinting pigment, and a maroon pigment.

2,191,999. Cylinder paper machine. Wilhelm Thaler, assignor to American Voith Contact Co. Inc., New York, N. Y. Filed Sept. 15, 1937. 1 claim. (Cl. 92-43).

2,192,000. Activation of clays. William S. Wilson, assignor to Monsanto Chemical Co., St. Louis, Mo. Filed Dec. 19, 1936. 2 claims. (Cl. 252-2). Use of sulphuric acid.

2,192,030. Process for the manufacture of a lignin-containing press mass. Hermann Burmeister, assignor to General Electric Co., Schenectady, N. Y. Filed Dec. 8, 1936. 3 claims. (Cl. 260-47). A mixture of pulverized lignin, phenol solution, and benzene is kneaded for 4 hr. at 75 deg. C. and the solvent and unreacted phenol are removed.

March 5, 1940

R21,381. Papermaking machine. John P. Pederson, Battle Creek, Mich. Original No. 1,937,125, dated Nov. 28, 1933. Application for reissue Aug. 1, 1939. 37 claims. (Cl. 92-44).

2,192,168. Paper drying system and apparatus therefor. John W. Bell, St. Catharines, Ontario, Canada. Filed Sept. 17, 1937. 3 claims. (Cl. 34-24). The web is passed about rolls heated by steam at a pressure above atmospheric and enclosed in a chamber provided with slots; the steam is withdrawn from the chamber at a rate less than it is evolved from the paper and a part of the steam escapes through the slots, preventing the entrance of air into the chamber.

2,192,177. Machine for making satchel-bottom bags. Ludwig Bischoff, assignor to Oneida Paper Products Inc., New York, N. Y. Filed June 23, 1936. 5 claims. (Cl. 93-27).

2,192,202. Pulping process. Floyd C. Peterson, Midland, Mich., and Louis E. Wise, Winter Park, Fla. Filed Oct. 23, 1936. 14 claims. (Cl. 92-9). The pulping liquor comprises at least 70 per cent by weight of an alkylolamine.

2,192,239. Process of digesting wood or other ligno-cellulose materials. George Victor Palmrose, assignor to Weyerhaeuser Timber Co., Tacoma, Wash. Filed Dec. 7, 1937. 4 claims. (Cl. 92-11). Only a portion of the material is submerged in a concentrated solution of a bisulphite (Alkali metal and magnesium) and the overlying portion is continuously wetted with the liquor.

2,192,432. Web treating apparatus. Hobert W. Bruker, assignor to George W. Swift, Jr. Inc., Bordentown, N. J. Filed June 18, 1938. 7 claims. (Cl. 91-18). A web steaming apparatus.

2,192,453. Means for applying adhesives. Paul Rentsch, assignor to I. Miller & Sons Inc., Long Island City, N. Y. Filed April 12, 1937. 2 claims. (Cl. 91-43).

2,192,461. Production of concentrated sulphur dioxide. Conway Baron von Girsewald, Gerhard Roesner and Max Wohlwill, assignors to American Lurgi Corp., New York, N. Y. Filed March 11, 1938. 1 claim. (Cl. 23-178). Method of recovery of SO_2 from gases by scrubbing with an organic base and treating the resulting solution with water.

2,192,488. Method of making paper. Arthur Reilly, assignor to S. D. Warren Co., Boston, Mass. Filed July 1, 1936. 8 claims. (Cl. 92-21). A paper containing an alkaline filler is surface sized with an ammonium resinate and resin regenerated therefrom or an ammonium salt.

2,192,516. Insulation sheet material. George R. Cunnington, assignor to Woodall Industries Inc., Detroit, Mich. Filed May 28, 1937. 6 claims. (Cl. 154-44). A laminated structure com-

prising a vibratile metal sheet, with a corrugated fibrous material on one side and sound damping masses of thermoplastic material in the cavities.

2,192,517. Composite laminated insulation material. George R. Cunnington, assignor to Woodall Industries Inc., Detroit, Mich. Filed June 17, 1937. 3 claims. (Cl. 154-2).

2,192,582. Shipping carton for chinaware. James J. Smith, assignor to Onondaga Pottery Co., Syracuse, N. Y. Filed Jan. 3, 1938. 2 claims. (Cl. 206-65).

2,192,583. Synthetic resin coating composition. Charles Bogin, assignor to Commercial Solvents Corp., Terre Haute, Ind. Filed July 21, 1937. 2 claims. (Cl. 260-32). A vinyl resin in a nitro-paraffin which produces resistant, adhesive, and stable protective or ornamental surface coatings.

2,192,724. Paper marking apparatus. Arthur M. Wickwire, Jr., assignor to Chambon Corp., Garfield, N. J. Filed April 5, 1938. 9 claims. (Cl. 101-153). A machine for marking webs of different widths.

2,192,865. Cotton yarn for drier felts and the like and method of making the same. Boris Monsaroff and Walter Scott Burrill, assignors to Cosmos Imperial Mills Ltd., Hamilton, Ontario, Canada. Filed Jan. 9, 1939. 9 claims. (Cl. 57-153).

MARCH 12, 1940

2,192,875. Labeling machine. Walter H. Weeden, assignor to Pneumatic Scale Corp. Ltd., Quincy, Mass. Filed Nov. 17, 1937. 8 claims. (Cl. 91-47).

2,192,923. Method of producing moisture-proof fiber containers. Donald G. Magill, assignor to American Can Co., New York, N. Y. Filed Nov. 17, 1937. 2 claims. (Cl. 93-94). A method of applying a parchment strip coated with asphalt to a tube.

2,192,937. Pulp molding die. Ernest L. Shepard, assignor to Canal National Bank of Portland, Portland, Me. Filed Aug. 24, 1938. 2 claims. (Cl. 92-54).

2,192,953. Coating composition. Clifford K. Sloan and Gordon D. Patterson, assignors to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed July 22, 1936. 17 claims. (Cl. 134-39). A pigment and a binder, such as a drying oil, a synthetic resin or a cellulose derivative, with an aliphatic polyhydroxy amine.

2,192,955. Use of amines with pigments. Clifford K. Sloan and Gordon D. Patterson, assignors to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed July 22, 1936. 22 claims. (Cl. 134-39). Lead pigments with an amine.

2,192,956. Pigment manufacture. Clifford K. Sloan and Gordon D. Patterson, assignors to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed July 22, 1936. 10 claims. (Cl. 134-58). The use of amines.

2,193,006. Drum sieve. Antonius Kufferath, assignor to Neumeyer & Dimond Inc., New York, N. Y. Filed March 30, 1937. 8 claims. (Cl. 92-43). A dandy roll.

2,193,032. Suction slice for papermaking machines. Kenneth J. Mackenzie, assignor to Eastman Kodak Co., Rochester, N. Y. Filed Jan. 16, 1937. 4 claims. (Cl. 92-44). A combined slice and foam controller.

2,193,052. Formation of corrugated webs. Henry Atwater, Worcester, Mass. Filed Jan. 7, 1937. 13 claims. (Cl. 154-30).

2,193,173. Bleaching of cellulose fibers in peroxide baths. Karl Jellinek, assignor to General Aniline & Film Corp., a corporation of Delaware. Filed Dec. 16, 1938. 4 claims. (Cl. 8-111). The material to be bleached with alkaline peroxide is pretreated in a bath containing 0.001 to 0.01 g. of cobalt in the form of a water-soluble salt.

2,193,301. Bleaching cellulose. Max Steinschneider and Erich Knopf, assignors to Aschaffenburger Zellstoffwerke Aktiengesellschaft, Berlin, Germany. Filed July 23, 1937. 3 claims. (Cl. 8-105). The pulp is forced through a jet apparatus and the chlorinating agent is drawn into the jet by the suction resulting therein, whereby intimate contact and mixture takes place in the diffusor of the jet apparatus between the chlorinating agent and the pulp.

2,193,412. Manufacture of paper-disk bottle caps. William Gordon, assignor to Southam Press Montreal Ltd., Montreal, Que., Canada. Filed May 17, 1939. 3 claims. (Cl. 93-1.3).

2,193,439. Wrapper with heat-responsive marking. Harold S. van Doren, Hempstead, N. Y. Filed April 25, 1939. 7 claims. (Cl. 131-15).

2,193,472. Roofing. Meinrad C. Bothe and Frank X. Pfohl, assignors to Logan-Long Co., Chicago, Ill. Filed Nov. 8, 1935. 9 claims. (Cl. 91-30). A machine for coating roofing.

2,193,493. Fermentation process for the preparation of paper pulp from bagasse and similarly incrusted cellulose fibers. Ernest Augustus Ritter, assignor to Universal Cellulose (Proprietary) Ltd., Durban, Natal, Union of South Africa. Filed June 2, 1938. 14 claims. (Cl. 195-10). The bagasse is fermented with a natural bacteria of the bagasse until the greater part of the noncellulosic material is removed and the bales then dipped in dilute soda, sulphate, sulphite, or monosulphite solution and dried to a moisture content of between about 12 and 20 per cent.

2,193,543. Composition applicator. William Wanner, assignor to Sam'l Bingham's Son Mfg. Co., Chicago, Ill. Filed May 2, 1938. 8 claims. (Cl. 91-43). A composition applicator for a roller coating machine.

2,193,695. Treatment of paper and board. Sidney Musher, assignor to Musher Foundation Inc., New York, N. Y. Filed March 29, 1939. 9 claims. (Cl. 92-21). Antioxygenic paper and board containing between about 0.2 and 5 per cent of cacao residues and having a pH of between about 4 and 6.9; the product is heated at at least 220 deg. F.

2,193,755. Bag. True M. Avery, assignor to Union Bag & Paper Corp., Hudson Falls, N. Y. Filed May 12, 1938. 1 claim. (Cl. 229-60).

2,193,756. Method of making bags. True M. Avery, assignor to Union Bag & Paper Corp., Hudson Falls, N. Y. Filed Oct. 14, 1938. 4 claims. (Cl. 93-35).

MARCH 19, 1940.

2,193,818. Process for producing proteic coating or film upon fiber, textile, or the like. Toshiji Kajita, Ryohei Inoue, and Akira Yamanouchi, assignors to Showa Sangyo Kabushiki Kaisha, Tsurumiku, Yokohama, Japan. Filed Sept. 8, 1937. 2 claims. (Cl. 91-68). An alkaline extract of the protein of the soya bean with a stabilizing agent of the group consisting of sugar and tartaric acid is used as a sizing agent, the protein being coagulated with an acid bath.

2,193,831. Moistureproofing. James A. Mitchell, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed June 4, 1937. 35 claims. (Cl. 91-68). Cellulose nitrate, cellulose esters, and cellulose ethers with a plasticizer.

2,193,861. Method of and apparatus for impregnating fibrous materials. Daniel J. Crowley, Lowell, Mass. Filed May 2, 1934. 7 claims. (Cl. 91-46). Thick sheets of loose fibers are passed between a pair of screens and the screens and sheet are subjected to a succession of progressive compressions, while immersed in an impregnating liquid.

2,193,888. Method of producing seams in dandy rolls and apparatus therefor. Peter S. Sinclair, Holyoke, Mass. Filed Jan. 4, 1938. 14 claims. (Cl 140-3).

2,194,216. Manufacture of a starch adhesive and adhesive base. Philip Dalton Coppock, Higher Bebington, Cheshire, England. Filed March 23, 1937. 10 claims. (Cl. 134-23.4). A cold water swelling starch powder containing a small proportion of an alkaline earth oxide with sufficient oil to film the oxide particles.

2,194,253. Coating apparatus. Raymond C. Benner, Romie L. Melton and Henry P. Kirchner, assignors to Carborundum Co., Niagara Falls, N. Y. Filed Oct. 27, 1932. 10 claims. (Cl. 91-18). Method for the manufacture of granular coated webs.

2,194,275. Method of making a container. Herman Carew, assignor to Dixie-Vortex Co., Chicago, Ill. Filed Oct. 28, 1938. 5 claims. (Cl. 93-36.2). A printed paper cup blank.

2,194,291. Stencil coating compound and process of making the same. J. Paul Bishop, assignor to Corn Products Refining Co., New York, N. Y. Filed Nov. 30, 1938. 16 claims. (Cl. 41-38.6). The coating consists of an aqueous ethyl alcoholic solution of zein and a plasticizing agent.

2,194,301. Cellulosic product. Charles A. Fourness and Kenneth J. Harwood, assignors to Paper Patents Co., Neenah, Wis. Filed Sept. 24, 1937. 4 claims. (Cl. 220-9). A low density insulating material for a refrigerator consists of thin, creped cellulosic tissue papers superposed one upon the other.

2,194,337. Greaseproof zein compound. Collins Veatch, assignor to Corn Products Refining Co., New York, N. Y. Filed Aug. 2, 1937. 5 claims. (Cl. 134-12). A greaseproof coating composition consists of 100 parts of zein, 10-25 parts of urea, 10-25 parts of glycol and 300 parts of 95 per cent ethyl alcohol which is heated to remove the solvent and give a solid product.

2,194,427. Method of making roofing or like covering material. Lester Kirschbraun, assignor to Patent and Licensing Corp., New York, N. Y. Filed July 6, 1935. 2 claims. (Cl. 91-68). A building strip in which a portion carries a film of a water-insoluble metallic soap.

2,194,428. Asphalt coated material. Lester Kirschbraun, assignor to Patent and Licensing Corp., New York, N. Y. Filed Dec. 30, 1936. 4 claims. (Cl. 91-68). The asphalt has an oil diffusing substance incorporated therein to retard hardening of the coating by the weather.

2,194,435. Mechanism for manufacture of tubular paper structures. David C. Spaulding Jr., assignor to Standard Oil Co., Cleveland, Ohio. Filed July 1, 1937. 5 claims. (Cl. 91-37).

2,194,436. Tubular paper machinery. David C. Spaulding, Jr., assignor to Standard Oil Co., Cleveland, Ohio. Filed July 1, 1937. 6 claims. (Cl. 93-81).

MARCH 26, 1940

2,194,472. Production of abrasive materials. George H. Jackson, assignor to Carborundum Co., Niagara Falls, N. Y. Filed Dec. 30, 1935. 6 claims. (Cl. 51-185).

2,194,479. Sulphide pigment. Kenneth S. Mowlds, assignor to Glidden Co., Cleveland, Ohio. Filed Sept. 2, 1936. 13 claims. (Cl. 134-78). A white pigment composition comprising a sulphide and a water-soluble thiocyanate.

2,194,910. Spectrophotometer. Orrin Weston Pineo, assignor to American Cyanamid Co., New York, N. Y. Filed Sept. 7, 1938. 6 claims. (Cl. 88-14).

2,194,956. Bleaching pulp. Maurice C. Taylor, and George P. Vincent, assignors to Mathieson Alkali Works Inc., New York, N. Y. Filed Jan. 10, 1939. 13 claims. (Cl. 8-105). An aqueous suspension of pulp and chlorite is formed at a pulp density of 15 per cent under conditions that the chlorite is substantially inactive and thereafter activating the chlorite.

2,195,096. Imitation reed and method of forming same. Wade E. Sacker and John E. Millett, assignor to Grand Rapids Fibre Cord Co., Grand Rapids, Mich. Filed Sept. 16, 1939. 8 claims. (Cl. 93-84). A concavo-convex paper imitation reed of paper and method of manufacture.

2,195,101. Coating machine. Jay G. Swab, assignor to Fred Goat Co., Inc., Brooklyn, N. Y. Filed April 29, 1937. 18 claims. (Cl. 91-43). A coating machine for applying a thin uniform film of liquid to a web of paper of variable thickness.

2,195,239. Process for the manufacture of artificial leather and parchment and products obtained thereby. Lucien Marie Charles Champsaur, Paris, France. Filed April 2, 1936. 5 claims. (Cl. 154-34). A vegetable parchment having a parchmented face and a soft and velvety face, formed by a layer of fibers of the original paper in an open and disorganized state.

2,195,240. Molded pulp article. Merle P. Chaplin and Charles J. Chaplin, assignors to Chaplin Corp., Portland, Maine. Filed Oct. 26, 1937. 7 claims. (Cl. 242-122). A hollow textile cone or cop.

2,195,302. Bleaching pulp. Clifford Allen Hampel, assignor to Mathieson Alkali Works Inc., New York, N. Y. Filed Jan. 10, 1939. 3 claims. (Cl. 8-105). The chlorites in a pulp suspension having a density in excess of 15 per cent is activated by a mixture of an inert gas and hydrochloric acid gas.

2,195,378. Process of producing cellulosic pulp. Thomas L. Dunbar, assignor to Chemipulp Process Inc., Watertown, N. Y. Filed Nov. 22, 1935. 20 claims. (Cl. 92-7). A method of circulating hot alkaline liquor in the digester and of heating the liquor in a pressure vessel.

F. L. LaQue Is Promoted

A. J. Wadhams, vice president and manager of the Development and Research Division of The International Nickel Company, Inc., announces that F. L. LaQue, who has been assistant director of Technical Service on Mill Products in New York, is now engaged in development activities on all applications of both ferrous and nonferrous nickel-containing alloys.

William A. Mudge, formerly Works Metallurgist of the company's rolling mill at Huntington, W. Va., and who recently joined the Technical Service Section of the Development and Research Division in New York, has been appointed assistant director of Technical Service to succeed Mr. LaQue.

Mr. LaQue who is a member of the Technical Association of the Pulp and Paper Industry, has been associated with International Nickel since 1927, devoting his activities to the field of corrosion and corrosion resisting materials.

The Relation of Starch to Microbiological Problems and Methods for Controlling Bacterial Growth*

By Alexander Frieden[1]

Abstract

The microbiological problems due to the use of starch in paper manufacture, bactericidal substances, and the bactericidal effect of drying paper are discussed.

Starch is practically a pure carbohydrate, lacking in protein, amino acids, vitamins, and other essential food elements to make it a good feeding ground for bacteria. Chemical substances used in starch manufacture tend to destroy or restrict bacterial growth. The general types of microorganisms present in starch are not pathogenic, usually.

Bacteria tends to decrease in starch, while the starch is in storage, and the exercise of reasonable care in the paper mill will restrict their metabolic and generative processes.

Paper manufacturing processes were found to reduce the bacterial residue; in particular, the high temperatures used in drying paper and paperboard, which are considerably higher than temperatures of pasteurization.

A discussion of the microbiological problems arising from the use of starch in the paper mill must be treated largely from the abstract rather than from the practical point of view, for in practice, there should be no serious bacterial problems attending the use of starch. Starch when used with ordinary care should present few microbiological problems, fewer by far than many other substances used for the same purposes.

Starch, as such, does not present good feeding grounds for bacteria. A good food must contain carbohydrates, protein, minerals and certain other essential factors. Recent researches have shown that some of the essential amino acids which are necessary for the growth of human beings such as cystine, leucine, etc., are also essential for the growth of bacteria, and that even bacteria require vitamins for their well being. Starch is practically pure carbohydrate and is, therefore, far from being an ideal or complete food.

Bacteria are found in starch and sometimes in large numbers. Generally, these bacteria are invaders. Few bacteria originally present in the plants such as corn, cassava, etc., from which the starch is made, are left in the finished starch. The chemical substances used in the maufacture of starch tend to destroy the native bacteria and to restrict the growth of the most resistant strains. Those that are present in the finished starch are of the type that are prevalent in the atmosphere, the type that we inhale every time we take a breath. Consequently, the number of bacteria present in the finished starch depends largely on two factors: first, on the chemical treatments to which the starch is subjected during its manufacture, and second, on environmental factors, i.e., on the bacterial flora and fauna present in the air, the water, and equipment with which the starch comes into contact while it is being manufactured.

Treatments

Chemical Treatments

In corn starch, the chemical treatments, having an important bearing on the number of bacteria that remain in the finished starch, are principally two, namely, the steeping of the corn and the washing of the raw starch. In the steeping process, sulphur dioxide is generally used in sufficient concentration to destroy or inhibit the growth of microorganisms. In the washing and purification of starch, a variety of chemicals may be added to the wash water which serve both to modify the nature of the starch and to control bacterial growth. The type of chemical substance used, its concentration and the severity of the treatment, will have an important bearing on the number of bacteria or spores left in the starch. Thus, oxidized starches, which undergo a more rigorous chemical treatment than the thick boiling starches, generally contain fewer bacteria.

Physical Treatments

The important physical treatments, i.e., the environmental factors that affect the number of bacteria present in the finished starch, are principally drying and in the case of powdered starch, grinding. The wet starch after it is purified by repeated washings contains a large quantity of water, usually about 40 per cent, and this moisture must be reduced to about 10 per cent. There are a number of methods by which the starch may be freed from its excessive moisture. From the bacteriological point of view, the method which permits fastest and most thorough drying is the most satisfactory. Slow drying, drying in the presence of large quantities of untreated air, prolonged drying at low temperatures, all favor growth developments. Starches, dried by such methods, will contain larger numbers of bacteria or spores than the same starches dried by the more modern methods. In the grinding of pearl starch to powdered, the number of bacteria may increase to enormous proportions unless special precautions are taken. In methods of grinding, where there is a constant inflow of air of an unchecked bacterial content, the increase is particularly marked.

The table illustrates the wide variations possible in the bacterial content of corn starches.

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	Bacteria per gram
Pearl corn starch—From less than	1,000 to 140,000 (and probably higher)
Powdered corn starch—From less than	1,000 to 10,000,000
Thin boiling corn starch (oxidized)—Average	6,000
Starch dried by old method	16,000
Same stock dried by new method	1,000
Pearl starch	16,000
Same stock reduced to powder	6,000,000

These figures are of course averages but they serve to illustrate the wide variations possible. They show the possible upper limits. In actual practice, however, the averages will be much nearer the lower figures than the higher.

It should be noted that the average for thin boiling corn starch is quite low as compared with the thick boiling starches. The comparative number of bacteria of starch dried by a new and by an old method and also of the powdered starch compared with the pearl are indicative of what may happen in practice under these varying methods and conditions.

The bacterial content of tapioca flours was surprisingly uniform. Numerous analyses of high grade tapioca flour show the average count to be about 1,000 and seldom, if ever, does the count rise above 10,000. Even the lower grades of tapioca flour show surprisingly low count. Thus, a recent check in our laboratories of the bacteria counts of different tapioca grades revealed a maximum count of only 22,000.

Types of Microorganism

Far more important than the number of bacteria present in starch is the kind or type of bacteria. The most important considerations to the paper manufacturer are whether the material used in the manufacture of paper contains bacteria that might be injurious to health, when used in contact with food, or that might impart undesirable effects to the finished paper, or might cause manufacturing difficulties. For the purpose of this discussion we shall divide the types of microbiological organisms that might be present in starch into three rough classifications, namely (1) general, including molds, (2) *B. coli*, and (3) thermophilic bacteria.

General Microorganisms

The types of general microorganisms in starch are those commonly found in the air, soil, and water. They include such types as *B. subtilis, B. mesentericus, B. megatherium, B. fluorescens putidus*, and molds of the *aspergillus* and *pencillium* kinds, etc. These organisms and other such common ones will, under favorable conditions, ferment cellulose and starch. They are, however, so abundantly present throughout nature that their presence in starch used in paper mills contribute little to the total number or to the general bacterial problems of the paper mills. Furthermore, these organisms are not usually pathogenic. In this class should also be mentioned the bacteria that are associated with or generate enzymes which may hydrolyze cellulose. These are more or less common, and the general methods used by the paper mills for safeguarding against the undesirable effects of the bacteria abundantly present in the air and water should automatically take care of them.

Bacteria coli

In our studies we have paid particular attention to *B. coli*. These bacteria are not necessarily pathogenic as such. It is, however, an established maxim that, wherever *B. coli* are present, there is always the likelihood of the presence of virulent bacteria, that are particularly harmful to man and apt to invade the human organism. The presence of *B. coli* in any product is usually an indication of contamination and uncleanliness. In starch, large numbers of *B. coli* would be present only if the starch has been handled by human hands to an excessive degree or has been manufactured under unsanitary conditions. Contamination of starch with pathogenic bacteria is very improbable and any such bacteria would be killed in the drying operation.

In the majority of the examinations of starch, *B. coli* were absent. In only few instances of the corn starch analyses were *B. coli* existent. In no cases did we find *B. coli* in high grade tapioca flour and very rarely in the lower grades. We believe it safe to say that starch is usually free from *B. coli* and that when found, their presence should be attributed to accidental contamination rather than unsanitary conditions in the manufacturing plant. We may conclude, therefore, that contamination of starch by pathogenic bacteria is improbable, and such bacteria would be killed on the drying rolls.

Thermophilic bacteria

The thermophiles are bacteria which are "heat loving", i.e., they are not easily destroyed by elevated temperatures. Unlike the ordinary run of bacteria, which are killed off at pasteurization temperatures, the thermophilic strains will withstand temperatures of 240 deg. F. or even higher. There are a number of different strains of thermophiles. There are the *aerobic*, those requiring air for their life processes, and the *anaerobic*, those that exist in the absence of air. There are the flat sour spores, spores which will under favorable conditions give rise to bacteria, causing the medium in which they live to turn sour; the sulphide spoilage spores, spores which form bacteria that generate hydrogen sulphide, the offensive odor of rotten eggs; and "swells" spores, spores which will form bacteria that generate gas and form internal pressure on the walls of sealed containers in which the bacteria live.

The thermophilic bacteria are of particular interest to food manufacturers and especially to canners. If the raw materials contain excessive thermophilic spores, there is always the possibility of spoilage in the canned food, should conditions become favorable for the development of these bacteria. Therefore, the National Canners Association has established a standard that none of the raw materials used by canners should contain more than 150 spores per 10 grams. To paper manufacturers, the thermophilic bacteria are of interest mainly because, if present and uncontrolled, they may cause fermentation. Also, if the finished paper is used for containers in which food must be kept for a prolonged period of time, spoilage might result.

Examinations of starches for thermophilic spores show that unless the starch is subjected to special treatment to eliminate these types, they are apt to contain them. The ordinary run of corn starch will vary widely in its content of thermophilic spores. We have found these to run from less than 100 per 10 g. to as high as 12,000. Oxidized corn starches contain comparatively few thermophilic spores. Apparently, the more rigorous chemical treatment to which these starches are subjected eliminates them. Recent examinations of several samples of oxidized starches showed an average count of thermophilic spores of 85 per 10 grams. High grade tapioca flour runs low in thermophilic content. Many of the samples of high grade tapioca flour examined in our laboratories were within the specification of the Na-

tional Canners Association, and in few cases were they appreciably above these specifications. The lower grades of tapioca flour contain larger numbers of spores than the higher grades, but in general, these numbers are lower than those found in corn starches which are not subjected to special treatments during their manufacture.

Decrease of Bacteria in Materials in Storage

So far we have discussed briefly the number and types of microorganisms that may be present in starch when it leaves the starch factory. Before proceeding with methods of control of these microorganisms, it would be well to consider what takes place between the time the starch leaves the factory and the time it reaches the paper mill. This period of time is not conducive to growth for the bacteria that may be present in the starch. Their activities are greatly restricted and their life processes limited. Bacteria, like other living cells, must have water in order to grow and multiply. While starch contains moisture, which under humid conditions may run up to 15 per cent of its weight, most of this water is chemically combined with the starch and, therefore, is not available for use for other purposes.

A study of the history of microbiological organisms of starch and other dry food substances on storage has revealed the surprising fact that during the first stages of storage there is a slight increase in the number of bacteria followed by a decrease. This decrease may sometimes amount to about half of the original number if the material is kept on storage for 6 months or a year. These results have been observed in our laboratories, with both tapioca flour and with dry egg yolk.

This apparent contradiction may be explained by the fact that in the freshly prepared starch, some free water is no doubt available. This free water enables some bacteria to grow and multiply. But the end products of the life processes of bacteria are generally toxic to their own kind, the bacteria begin to die off as these end products accumulate and as the free water becomes saturated with them. The user of starch need, therefore, have no apprehension of bacterial growth in starch while in storage. As long as the starch is kept in a dry place, reasonably cool, the tendency will be for a reduction of the number of bacteria rather than for an increase.

Methods of Control of Microorganisms

Regeneration and Breeding Grounds of Bacteria

The activities of bacteria and the regeneration of spores into bacteria begin at the mill when the starch is put into water. Here water is abundant and may be freely utilized by the various organisms in their metabolic and generative processes. At this point there is the further possibility of increasing the number and kind of bacteria from both atmospheric contaminations and from residues of previous cooks that remain in the barrels or kettles. Such residues are apt to be rich breeding grounds for micro-organisms.

It is at this stage that the paper manufacturer should begin to exercise care in order to control bacterial growth. Generally, there are three chief means of controlling bacterial growth: heat, sunlight including artificial light rays, and chemical substances. To these three it would be well to add a fourth, namely, the use of reasonable care in handling starch with particular emphasis on the use of clean equipment. The worker should be trained to rinse out the barrel or kettle after the starch is removed, to steam it for a few minutes, or to use water containing bactericidal substance in solution.

Of the three established methods for bacterial control, light rays are of little practical importance to the paper mill. Heat and chemicals are the two on which the paper manufacturer should depend.

Use of Heat

In heating the starch with water to form a jell, temperatures considerably above that of pasteurization are reached. Usually the temperature will vary between 150 and 190 deg. F. This heat is sufficient to destroy the bacteria present in starch with the exception of thermophiles. The latter, if present under conditions favorable to their growth, require chemical methods of control.

It has been our experience that a starch jell will keep unspoiled for a reasonable length of time. Thus, corn starch or tapioca flour cooked in a concentration of 1 to 20, i.e., a 5 per cent dispersion, will remain unspoiled for 2 to 3 days, even when left exposed to the atmosphere and subjected to opportunities for contamination. If cooked in clean containers, kept closed, and stored in a fairly cool place, the starch jell may last for a week or more before souring or decomposition sets in.

Concentration of the cook, i.e., the ratio of water to starch, is an important factor on the rate of spoilage. The more concentrated the jell the slower will be the rate of growth of bacteria. This again is the question of free and bound water mentioned before. In such concentrated jells, it will sometimes be noticed that bacterial growth may begin on the surface where some free water has condensed and then grows inwards as the starch jell is liquefied. In this connection, when a medium is favorable for the growth of a particular organism, that organism may begin growing at such an accelerated rate as to prevent development of other organisms present in that medium. This explains the fact often noticed in practice that a starch may sour differently under different conditions.

Generally, heat and reasonable cleanliness in handling should be sufficient to keep the starch jell sweet until used up. Where the starch jell is kept unused for several days, or where the mill conditions are such as to result in rapid spoilage of the cooked starch, the best practice should be the addition of a small amount of bactericide to the jell.

Use of Chemicals

There are a number of chemical substances that may be used for bactericidal or preservative purposes. Chief among these are fluorides, zinc salts, copper salts; boric acid, and borates; benzoic acid, oxybenzoic acid, and the benzoates; salicylic acid and the salicylates; phenols, such as phenol, cresol, resorcinol; formaldehyde or compounds yielding formaldehyde; chlorine, chlorinated phenols; etc. These substances vary widely in their bactericidal or preservative efficiency. Some are highly effective for certain organisms while comparatively harmless for others. It is sometimes necessary to experiment with several different types in order to determine the most effective.

In our laboratories we have made extensive studies of the efficacy of many of these chemicals as bacteri-

cides and preservatives. We have studied the concentrations required to preserve pastes of known composition and the conditions affecting their potency. In our experiments, we used, as a standard in most cases, a paste made from 5 per cent starch brought to 180 deg. F. We found that where no preservative was used, the cooked paste remained fresh from 2 to 4 days. Where chemicals were added, the period of freshness was increased, depending on the efficacy of the chemical substance. Where chemicals were used, the pastes were exposed to opportunities for contamination and the time required for spoilage noted.

The results may be summarized as follows:

Fluorides. Fluorides are rather poor preservatives for starch. Sodium fluoride, in a concentration of 1.5 per cent based on the dry weight of the starch, added very little to the keeping quality of the jell. Spoilage usually became evident on the fourth or fifth day. Sodium silico fluoride, however, was greatly superior to the simple fluorides. 1.5 per cent of sodium silico fluoride preserved the starch jell for 13 days, and 2 per cent kept it fresh for 28 days, the duration of this particular test.

Zinc salts. The zinc salts are fairly effective. Used in concentration of 1.5 per cent based on the weight of the dry starch, they will preserve the starch paste for about 15 days. In this respect, they are similar to sodium silico fluoride. There is little difference between the potency of zinc sulphate and zinc chloride.

Copper Sulphate. Copper sulphate is one of the most effective preservatives of starch jells. Used in the proportion of 0.5 per cent, based on the dry weight of starch, it was sufficient to keep the starch jell unother series, where 1 per cent of copper sulphate was used, the starch jell remained unspoiled after 70 spoiled for 28 days, the period of this test. In andays.

Formaldehyde. Formaldehyde and paraformaldehyde are very effective. Based on paraformaldehyde, the effectiveness is about the same as that of copper sulphate. That is, 0.5 per cent of paraformaldehyde is sufficient to keep the starch jell fresh for a month or more. When the liquid formaldehyde is used, 0.1-0.2 per cent of the finished jell is recommended.

Boric acid and borates. Boric acid and borates are rather ineffective as compared with the other substances. Their use as preservatives is not recommended except in cases where the more toxic substances cannot be used.

Benzoic acid. Benzoic acid and its salts are quite effective. About 0.2 per cent benzoic, based on the dry weight of starch, is sufficient to keep a starch jell fresh for 2 to 3 weeks. The para-oxybenzoic acid and its salts are more effective than the benzoic acid. However, the benzoates are more expensive than the inorganic salts or formaldehyde and should be used only where the use of copper sulphate or formaldehyde is undesirable.

Salicylic acid. Salicylic acid and the salicylates are fairly good preservatives. They are not, however, as effective as the benzoates and are also more costly.

Phenol. Phenol is a comparatively poor preservative for starch jells. It is not nearly as potent as copper sulphate, paraformaldehyde or benzoic acid. To preserve a starch jell for any length of time it was necessary to use a minimum of 4 per cent. Its use in paper is, therefore, questionable. The same holds true with the other phenols, such as the cresols.

Chlorinated phenols. Chlorinated phenols are considerably more effective than the phenols. It is likely that the effectiveness may be due mainly to the mobility of the chlorine atom. Chlorine itself is an extremely efficient bactericide, but its use with starch is not recommended as there is a chemical change which modifies the nature of the starch. All these tests refer to 5 per cent starch jells. As the concentration of starch changes, the amount of bactericide necessary for preservation would change slightly, being greater with higher dilutions and lesser with more concentrated solutions.

The above tests were run with the usual starches. With modified starches and dextrines the results might be different. We know that substances modified in a certain way will keep fresh for prolonged periods of time with benzoic or salicylic acid, but will decompose quickly even in the presence of 2 per cent of copper sulphate or paraformaldehyde and *vice versa.* The molds and yeasts which are abundantly present in nature and may easily cause contamination and spoilage may be affected differently than the bacteria.

Each case has to be studied separately, but a considerable element of safety may be assured by using a combination of paraformaldehyde and benzoic acid. Formaldehyde is more effective against bacteria than against yeasts or molds while benzoic acid is effective against molds. The copper salts are the most effective agents against molds and yeasts.

Drying of Paper Destroys Bacteria

Examining the principal operations in the paper mills for the manufacture of paper, they tend in the main to minimize the possibility of bacterial growth and to reduce the bacterial residue left in the finished paper. Looking at these operations solely from the point of view of starch, we find that in the beater even when the starch is used uncooked, which is seldom, its bacterial content is of comparatively little significance. It is greatly overshadowed in this respect by the character of the furnish.

When used for tub sizing, for the calenders and for coating, the starch is cooked. This destroys to a marked degree bacterial life even without the use of bactericides. In the formation of the sheet or board there is considerable heat applied during the drying which further acts to keep down the development of microorganisms.

The effect of starch in finished paper should be to restrict the growth of microorganisms rather than to encourage them. Finished paper contains about 6 per cent moisture. This percentage of moisture is considerably lower than that normally present in flours or dry foodstuffs. It is no doubt in the form of 'bound' water and is not available for utilization by micro-organisms. The presence of starch not only binds this water more thoroughly, but further permits the tying up of moisture that may be absorbed by the pulp subsequent to its manufacture into paper. Starch, particularly modified starches, contain many hydrating groups, which are inherently capable of chemically combining small quantities of water, thus eliminating this water from possible utilization by bacteria, and increasing the safety factors from the bacteriological point of view.

Acknowledgement

Acknowledgement is made to Thomas G. Heiser, chief chemist of the Stein, Hall & Co., Long Island City, N. Y., laboratories for most of the data on preservatives.

Prosize*

By B. W. Rowland[1] and W. M. Bain[2]

Abstract

No new data are presented in this report. There is a general discussion of the phenomenon of rosin sizing and the several theories which have been developed during the past to account for the known facts concerning rosin sizing. Among these is the measurement of the interaction of the cellulose pulp and the rosin size and the influence of the pulp on the hydrolysis equilibrium of saponified rosin. In addition to the importance of the colloidal condition in which the rosin is added to the furnish, it is pointed out that no comprehensive view of the problem of rosin sizing can be reached unless all constituents of papermaking furnish are taken into account. The present paper points out that the pulp, as well as the amount of alumina, and the quantity and nature of dissolved salts in the furnish all play an important role in the sizing mechanism. The preponderance of evidence seems to indicate that a certain proportion of combined rosin and free rosin should be furnished for best results under most operating conditions and the theoretical reasons for this view are outlined. In addition to the necessity of furnishing the rosin in the correct colloidal condition, it is noted that other factors must be satisfactory if good sizing is to result. On the basis of certain theoretical considerations and the results of earlier fundamental research on the mechanism of rosin sizing, a theoretically improved formula was developed which should meet a number of the sizing requirements under operating conditions.

Perhaps, historically, the most controversial feature of the rosin sizing problem has centered around the relative value of aluminum resinates as compared with free rosin in sizing. This controversy began some sixty years ago, dating from the time when Würster took exception to the earlier theories favoring aluminum resinate as the most effective form of rosin for the sizing of paper. Since that time many investigators have studied this and various other phases of the rosin sizing problem, progress having been surveyed from time to time *(1-5)*. The present purpose is not to summarize the various theories now held regarding the mechanism of rosin sizing, or the factors which have been recognized in influencing the course of the sizing reactions. An attempt is made, however, to recount briefly certain facts and theories concerning the problem which were found useful in leading to the development of a new rosin sizing composition which has now demonstrated its usefulness.

Possibly if an ideal size were made available, it would be expected to produce uniform sizing; be of improved effectiveness to the extent that sizing coats could be reduced; produce satisfactory sizing under a wide variety of furnish conditions; and give sizing results approximately in proportion to the increments of size furnished. Still other virtues could be ascribed to the perfect size, but these four points would seem to include the major requirements and they also serve to call attention to the salient sizing problems with which the industry has had to contend.

At the present time, opinion appears to be as much divided as ever regarding the optimum chemical form in which the rosin should appear in the finished sheet, and the optimum chemical and colloidal condition in which the rosin should be added to the furnish. It is quite possible that both free and combined rosin are desirable, and this intermediate ground also has its proponents *(6)*. Certainly, many of the size compositions resulting from the empiricism of the past contain a considerable proportion of free rosin. The fact is, apparently, that it is impossible in this respect to generalize broadly in the sizing field. It is equally misleading to oversimplify the rosin sizing mechanism in view of the great number of variables present, only a few, if any, of which can now be fully evaluated. Rowland *(7)* has pointed out that the behavior of rosin soap is influenced strongly by the other constitutents of the furnish, the cellulose itself being of remarkable importance in this respect. It follows, therefore, that the colloidal condition of the rosin in the furnish and in the finished paper will become dependent upon the complete set of conditions which establish the colloidal system and this in turn never remains fixed in any given case. The fundamental studies of Bialkowsky *(8)* demonstrated the capacity of the pulp itself to influence the hydrolysis of saponified rosin. This is in accord with the observations of Ecke *(9)* that the rosin in the white water contains more free rosin than was originally present. Bialkowsky found that rosin soap is not greatly hydrolyzed into free rosin, even in dilutions of beater concentration; but that some pulps (those capable of hydrolytically adsorbing appreciable amounts of alkali) may force this hydrolysis to a great extent. It seems important to note that, when the various pulps studied are arranged in order of their capacities to bind alkali and also to liberate free rosin from rosin soap, they are also in order as to their sizing behavior in commercial experience. Thus rag and alpha pulps possess these alkali-binding properties to the least extent and are the most difficult to size; the less pure pulps show greater alkali affinity, and are the more easily sized. Robinson *(10)* found that the relative amounts of free and combined rosin appearing in air-dried handsheets were dependent upon the influence of the pulps on the hydrolysis of sodium resinate, other variables being excluded. Evidently the alum, which was added after a considerable period, reacted with the still unhydrolyzed size to produce the resinates of alumina, subsequently found. The analogy with commercial experience, however, was not complete in that the size tests on the handsheets referred to were too irregular to permit a correlation between the content of free and combined rosin and the actual size test. This was not surprising, in that the various methods of size testing did not give the same trends over a series of specimens; but regardless of the question of size

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testing, the analogy must not be pressed unduly, for the systems of Bialkowsky, as well as those of Robinson, were idealized and important departures were made from commercial practice in order to avoid certain variables and to emphasize others. The work does show, however, an arresting coincidence and to that extent it would suggest that the form of rosin exerting the most active sizing effects is that rosin which, in a free state, has been hydrolytically liberated at the surface of the fiber in a supposedly extremely finely divided condition. That the amount of such free rosin may never be sufficient for good sizing under practical papermaking conditions may well be, particularly when very hard water is used or when the beater is acid with white water return prior to the size addition. Another tentative deduction from the above is that the ideal size composition will not necessarily be found universally ideal, different furnish conditions and mill operating conditions requiring appropriate modifications in the size composition as furnished to the beater. Experience would seem to bear this out. It has been the goal of size makers to so prepare the rosin size that it would be as nearly correct as possible for many conditions of use, although it is to be expected that the size, particularly the saponified portion of it, will undergo extensive changes according to the nature of the furnish and the particular operating conditions which prevail.

Preparation of Mixtures of Free and Saponified Size

Among the available processes for preparing mixtures of free and saponified size, colloid technique offers three procedures for producing finely divided free rosin: (1) mechanical subdivision of gross sizes *(11)*, (2) condensation from molecular dimensions *(12)*, and (3) peptization or colloid-chemical subdivision *(13)*. All of these methods are now used in commercial practice for producing rosin sizing preparations containing dispersed free rosin.

Mechanical and Peptization Methods

The first of these procedures involves the use of temperatures sufficient to soften the rosin, and the application of mechanical forces in the nature of turbulence or frictional shear sufficient to cause a subdivision of the rosin particles. These particles are then stabilized against coagulation by the presence of a protective material, such as rosin soap and/or protein or similar protective colloids. The third method, that of colloidal peptization rests upon the general principle of the Ostwald "Bodenkörperregel" *(14)* which has been specifically applied to rosin-alkali systems. According to the Bodenkörperregel (an approximate translation being "solid phase effect"), when rosin is treated with caustic solutions, a certain amount of rosin passes into solution as saponified size and another portion becomes dispersed or peptized as free rosin in colloidal suspension, this suspension being stabilized by the saponified rosin present. It has been shown that in systems of this kind the total amount of rosin dispersed and in solution depends upon a number of variables such as temperature, age, thermal and mechanical treatment, and upon the quantity of the solid phase present. Due to these influences sols of equal concentration may differ greatly in the matter of dispersity and stability when prepared with varying amounts of the undispersed phase present. This may lead to a seemingly paradoxical case as follows (quoted from Ostwald):

If 5 g. of rosin be added to 50 cc. of 0.5 *N* sodium hydroxide, 70 per cent of the total amount of rosin will dissolve or become peptized; if, however, the total amount be increased from 5 to 8 g. under the same conditions, there will be a complete dispersion of the rosin. For complete dispersion there appears to be an optimum condition for peptization. The requirements of an optimum ratio of rosin to caustic for the best dispersion may be appreciated when it is observed that, with a small amount of peptized phase, the adsorption of a stabilizing soap may be so great as to discharge the particles and cause them to flocculate, whereas when the ratio of peptized phase to peptizing soap is increased, a zone of optimum adsorption of soap is reached giving a greater degree of stability, even with the increased amount of peptized material present. Passing further into a region of still higher ratio of peptized phase to soap in solution, a zone of lower stability is reached owing to insufficient soap being available for adequate stabilization of the dispersed phase, again with a result of flocculation. The system is further complicated by the changes in degree of dispersity of the peptized phase, the other variables influencing the system to the extent that the above does not constitute a full interpretation of the solid phase effect. It is to be observed, however, that commercial practice is based upon this method of dispersing rosin and, under the proper conditions, a finely divided and completely stabilized mixture of free and combined rosin may be obtained.

Molecular Condensation Method

The second of these methods for the formation of finely divided rosin, that of molecular condensation, is utilized in the preparation of Prosize. It rests upon the general colloidal principle that materials in molecular dispersion may, by virtue of chemical reaction, hydrolysis, temperature effects, or change of solvent, condense from the molecular into particle sizes of colloidal dimensions. The growth of such particle sizes may in many instances be arrested by the presence of surface-active agents which gather at the interface between the newly-formed particle and inhibit growth beyond a certain point. At the same time, and by virtue of the same interfacial film formation, the particles may become effectively stabilized. Thus in the case of rosin systems, it is possible to apply these principles. In the present instance, starting with saponified rosin, protein, such as will not disperse in the absence of alkali, may be added directly without additional alkali and by warming the size to a moderate temperature (around 60 deg. C.) the protein will disperse. In passing into dispersion the protein hydrolytically removes alkali from the rosin soap equilibrium and, as in the case of cellulose, although to a much greater extent, the protein will force the hydrolysis of the rosin size and yield an abundance of finely divided free rosin, which also becomes well stabilized by the protein, as the latter simultaneously becomes available. Were it not for the fact that large amounts of protein render the preparation more costly, the proportion of free rosin might thus be well controlled by protein addition alone. It has been found more economical to limit the amount of protein employed, however, and to extend the hydrolysis reaction by chemical means

through the application of the buffering principle. The reaction having been started with protein and sufficient of the latter being present to limit rosin particle size growth and to stabilize the particles, the hydrolysis may then be safely extended by the direct addition of an acidic material such as boric acid, which in this case forms with the alkali already present the borax-boric acid buffer system, thus giving a very satisfactory control of the hydrolysis reaction, without endangering the formation of local zones of sufficiently low *p*H as to practically or completely damage the preparation through flocculation effects.

It is possible and convenient to add dry boric acid crystals to the size. By this method the amount of free rosin may be easily controlled and adjusted to meet any particular operating conditions as may seem to be necessary. It is observed that the free rosin produced by these reactions is very finely divided and much of it is within the ultramicroscopic range. Apparently a complete size distribution of rosin particles is formed, the protein reacting much more slowly, and giving rosin particles generally larger than those liberated by the action of boric acid alone. In this manner a rosin size preparation containing a wide range of compositions with respect to free and combined rosin can readily be made without the use of any special equipment.

Sizing Factors

Another theoretical consideration arises with reference to sizing. It is important to furnish the size in as nearly suitable colloidal and chemical form as possible in order to favor optimum distribution and to guard against the influence of unknown variables. It is also important to recognize, in as far as possible, those factors which govern the necessary retention of the size throughout the formation of the sheet. According to Lee *(15)*, rosin appears to be irregularly distributed over the fiber surfaces in the finished sheet, the more irregular distribution being associated with the poorest sizing. Lee also observed that good sizing is associated with the finest particles of rosin, or perhaps we should say, resinous matter. Particles beyond the range of the microscope might also be present and, if so, they would be expected to play an important part in the sizing results. Many will undoubtedly agree with the conclusions of Lee that rosin sizing films of a continuous and extremely thin nature probably do not generally occur and, since these films or particles are discontinuous, the best sizing is associated with finely divided particles of resinous matter in the sheet. This must mean that those conditions of size and size precipitation which serve to fix the size in small particles on the fiber surfaces will favor good sizing, as contrasted to the possible set of circumstances which tend to cause a coarse agglomeration of the size, depending more on mechanical filtration for size retention than on particle-to-fiber-surface adsorption. Obviously, under the latter circumstances, sizing will be greatly influenced by those conditions in sheet formation which alter the mechanical filtration effects, and in certain cases it will follow that an objectionable 2-sided sizing will result. It would appear that optimum distribution of rosin in the sheet would result from a strong colloidal adsorption by the fiber surface of finely dispersed sizing material. Rosin itself may possess to a slight degree hydrophilic groups in its molecular structure, but these are scarcely to be expected to effect a marked adsorption of the rosin on pulp fibers, particularly when the electrostatic conditions are as adverse as they apparently are. The observation that satisfactory sizing does not result from an acid condition alone, as established with sulphuric acid, places alumina in a conspicuous light with reference to the sizing reaction. This is particularly true if the views of Thieriet and Delcroix *(16)* be correct to the effect that over a certain range in *p*H (4.5 to 6.5) the electrostatic charges on rosin and fibers are of opposite sign. If so, this opposite electrostatic condition should favor retention of rosin and satisfactory sizing should thus result as a matter of *p*H control alone. That such is not the case must mean that colloidal alumina must be relied upon for adequate rosin retention, a fact which has frequently been observed. An interfacial film, adhering to the surface of the rosin particles, and possessing in itself a marked surface activity and a strongly hydrophilic nature should, upon theoretical grounds, greatly improve the compatibility of rosin and the hydrophilic pulp fiber, and result in a stronger bond between the two. A hydrophilic envelope of this nature attached to the rosin particle would of necessity have to be destroyed in the final sheet, otherwise the rosin in the finished sheet would not be able to exhibit its hydrophobic nature. Thus it appears that the very thin films of protein, such as are employed to modify the surface behavior of rosin particles, must be broken down upon the drying of the paper.

Development of Prosize

Upon the basis of these theoretical considerations, a new rosin sizing composition has been formulated. Earlier in this discussion reference was made to a hypothetical and ideal rosin size; that no such universally ideal size is probable has likewise been pointed out. A size preparation, however, which permits (a) the ready control of ratio between free and combined rosin, (b) the presence of rosin in a very fine state of subdivision, (c) the adjustment of an optimum quantity of combined rosin so as to permit the hydrolytic adsorption of free rosin by the fibers, and (d) a more positive control of flocculation and adsorption characteristics would be expected to exhibit a sizing behavior that would favor better and more uniform sizing. Isolated soya protein (alpha protein) and boric acid have been shown to be suitable for this purpose. It might be mentioned that in this development, theory preceded practice.

During the past 20 months, Prosize, made with the above-mentioned soya protein and boric acid, has entered the regular manufacturing operation in 30 paper mills of the United States. This sizing composition has been found from experience to meet the industry's needs in the following respects:

1. Uniform sizing from hour to hour and on duplicate runs
2. Uniform sizing regardless of seasonal changes and temperature effects such as those resulting from long beating and hard jordaning
3. Good sizing undisturbed by the presence of calcium and magnesium salts, as, for example, in deinked stock containing considerable amounts of calcium fillers, and in rag stocks cooked with lime and bleached with calcium base bleach liquors
4. Good sizing at higher *p*H levels, thus meeting the requirements for low sheet acidity and longer wear of wires and felts
5. Satisfactory sizing with reduced rosin requirements, thus meeting the specifications of low rosin content and improved brightness
6. Uniform sizing on wire and felt sides of the sheet
7. Improved finish as on machine-glazed sheets
8. Harder sizing as measured by various methods, such as ink flotation, dry indicator, Valley size, pen and ink, and curl tests
9. An efficient size for bleached sulphate, bleached and unbleached sulphite, and rag stock
10. Lower sizing costs
11. Flexibility and simplicity of preparation

In the present practice, rosin size requirement is reduced to an extent of from 35 to 65 per cent, and the alum is reduced from 20 to 45 per cent, whereas rosin reduction of 30 per cent and an alum reduction of 20 per cent will pay for the necessary materials required in the preparation of Prosize. This results in a saving equal to the cost of from 5 to 35 per cent of the rosin and of from 0 to 25 per cent of the alum. Frequently sizing efficiencies are increased from 200 to 300 per cent, giving a product of generally improved uniformity and marketability.

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New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following members:

Leslie L. Anderson, screen room foreman and relief superintendent, Weyerhaeuser Timber Company, Pulp Div., Longview, Wash., is a 1931 graduate of Whitman College.

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Vernon S. Denison, sales engineer, Beloit Iron Works, Beloit, Wis.

John A. Feola, Jr., student, New York State College of Forestry, Syracuse, N. Y.

Carl E. Flander, technical adviser, the Jay Madden Corporation, New York, N. Y., is a 1935 graduate of the Technical University of Finland and was formerly with the Central Laboratory in Helsingfors and with Kymmene A/B.

Emilio Gagliardi, technical director, Celulosa Argentina, Rosario, Argentina, received his doctorate from the Polytechnic Institute of Milan in 1931.

Matthew F. Healy, Jr., student, New York State College of Forestry, Syracuse, N. Y.

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Louis I. Levinson, director, Levinson Medical and Analytical Laboratories, Brooklyn, N. Y. is a graduate of the Polytechnic Institute of Brooklyn (1930) and Columbia University (1931 M. A.).

Robert S. Magruder, Jr., student, New York State College of Forestry, Syracuse, N. Y.

Samuel C. Nevins, plant chemist, Armstrong Cork Company, Fulton, N. Y., is a 1923 graduate of Lehigh University.

Edward D. Rich, technical supervisor, Oregon Pulp and Paper Company, Salem, Ore., is a 1934 graduate of the Massachusetts Institute of Technology and was formerly with the Crown Willamette Paper Company and Rayonier, Inc.

Gordon Rowlandson, assistant chemist, Spruce Falls Power and Paper Company, Kapuskasing, Ont., is a 1939 graduate of the University of Toronto.

Braxton M. Ryan, salesman, Asten-Hill Manufacturing Company, Philadelphia, Pa., attended Drexel Institute and was formerly with the Pusey & Jones Company and the Johns-Manville Corp.

Fred K. Shankweiler, chemical engineer, Hercules Powder Company, Kalamazoo, Mich., is a 1928 graduate of Pennsylvania State College.

C. Peter Spring, chemist, Chase Bag Company, Chagrin Falls, Ohio, is a 1937 graduate of the New York State College of Forestry, Syracuse, N. Y. and was formerly with the Riegel Paper Corporation, Milford, N. J.

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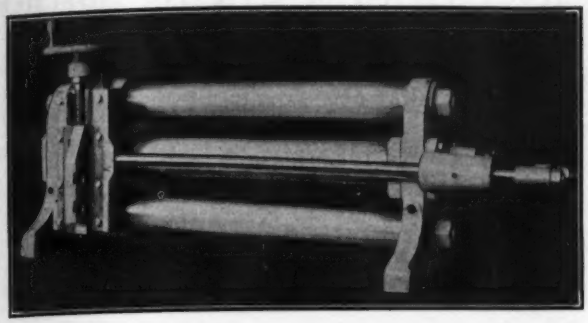

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Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING APRIL 20, 1940

SUMMARY

Wall paper .....1 cs.
Newsprint .....1,169 rolls
Wrapping paper .....611 rolls
Filter paper .....4 cs.
Surface coated paper.....62 cs.
Transparent paper .....1 cs.
Miscellaneous paper .....14 cs.

WALL PAPER

C. Asche, *Pollux,* Antwerp, 1 cs.

NEWSPRINT

Jay Madden Corp., *Mathilda Thorden,* Mantyluoto, 773 rolls.
H. Reeve Angel & Co., Inc., *Mathilda Thorden,* Mantyluoto, 396 rolls.

WRAPPING PAPER

H. A. Gogarty, *Agwistar,* Tampico, 611 rolls.

FILTER PAPER

H. Reeve Angel & Co., Inc., ———, Liverpool, 4 cs.

SURFACE COATED PAPER

Gevaert Co., of America, *Pollux,* Antwerp, 62 cs.

TRANSPARENT PAPER

M. J. Corbett & Co., *Pollux,* Rotterdam, 1 cs.

MISCELLANEOUS PAPER

The Filtrator Coffee Apparatus, ———, Yokohama, 11 cs.
Japan Paper Co., *Volendam,* Rotterdam, 3 cs.

RAGS, BAGGINGS, ETC.

J. T. Flannery, *Examiner,* Alexandria, 415 bls. old cotton rags.
E. J. Keller Co., Inc., *Examiner,* Alexandria, 180 bls. old bagging.
Castle & Overton, Inc., *Examiner,* Alexandria, 165 bls. old rags.
D. Bennedetto, Inc., *Examiner,* Alexandria, 69 bls. bagging, 163 bls. old rags.
Robert Blank, *Examiner,* Alexandria, 83 bls. colored cotton rags.
———, *Examiner,* Alexandria, 220 bls. old bagging, 43 bls. hessions.
W. Steck & Co., ———, Antwerp, 358 bls. flax waste.
Continental Bank Trust Co., ———, Antwerp, 70 bls. flax waste.
E. J. Keller Co., Inc., ———, Rotterdam, 345 bls. rags.
———, *Siboney,* Havana, 265 bls. rags.
E. J. Keller Co., Inc., *Exhibitor,* Oran, 421 bls. old rags.
Darmstadt Scott & Courtney, *Volendam,* Rotterdam, 65 bls. old waste bagging.
———, ———, Liverpool, 19 bls. paper stock, 114 bls. rags.
Wedeman & Godknecht, Inc., *Exermont,* Constanza, 26 bls. rags.
W. J. Green & Co., *Brant County,* Antwerp, 122 bls. hemp waste.

OLD ROPE

W. Steck & Co., ———, Rotterdam, 57 bls., 45 coils.
W. Steck & Co., ———, Antwerp, 81 bls., 49 coils.

CASEIN

A. Hurst & Co., *Brazil,* Buenos Aires, 84 bags.

WOOD PULP BOARDS

Jay Madden Corp., *Mathilda Thorden,* Mantyluoto, 72 rolls, 28 tons; 679 bls., 60 tons.

BOSTON IMPORTS

WEEK ENDING APRIL 20, 1940

Pagel Horton & Co., Inc., *Kexholm,* Sweden, 1,250 bls. wood pulp.
———, ——— Melbourne, 50 bls. rags.
———, ———, Sydney, 7 bls. rags.

PHILADELPHIA IMPORTS

WEEK ENDING APRIL 20, 1940

Gottesman & Co., Inc., *Exermont,* Constanza, 1,500 bls. prime bleached sulphite, 300 tons.
E. J. Keller Co., Inc., *Examiner,* Alexandria, 208 bls. old cotton rags.
———, *Examiner,* Alexandria, 2 bls. rags.
Pulp Sales Corp., *Mathilda Thorden,* Mantyluoto, 500 bls. dry mechanically ground pulp, 100 tons.
The Public Ledger, Inc., *Mathilda Thorden,* Mantyluoto, 374 rolls newsprint paper.
H. Reeve Angel & Co., Inc., *Mathilda Thorden,* Mantyluoto, 207 rolls newsprint paper.

WILMINGTON IMPORTS

WEEK ENDING APRIL 20, 1940

Pulp Sales Corp., *Mathilda Thorden,* Gothenburg, 2,941 bls. bleached sulphite, 499 tons.

BALTIMORE IMPORTS

WEEK ENDING APRIL 20, 1940

Pulp Sales Corp., *Mathilda Thorden,* Mantyluoto, 520 bls. prime strong sulphite, 104 tons; 4,052 bls. prime strong sulphate, 810 tons.
Wilkinson Bros., & Co., Inc., *Mathilda Thorden,* Mantyluoto, 168 rolls newsprint paper.
Jay Madden Corp., *Mathilda Thorden,* Mantyluoto, 399 rolls newsprint paper.
H. Reeve Angel & Co., Inc., *Mathilda Thorden,* Mantyluoto, 654 rolls newsprint paper.

NORFOLK IMPORTS

WEEK ENDING APRIL 20, 1940

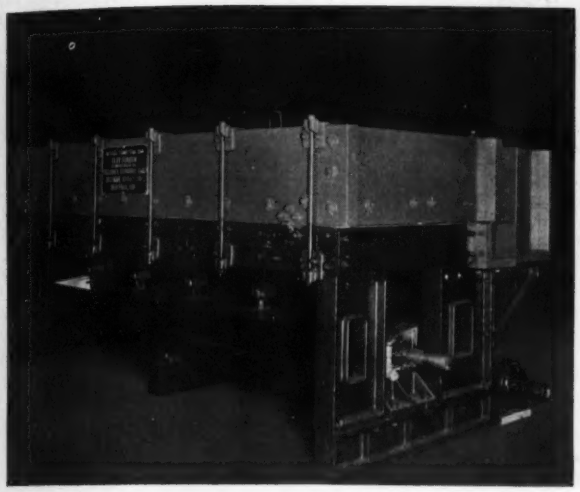
H. Reeve Angel & Co., Inc., *Mathilda Thorden,* Mantyluoto, 243 bls., 454 rolls newsprint paper.
Virginia Paper Co., *Mathilda Thorden,* Mantyluoto, 56 rolls newsprint paper.
Old Dominion Paper Co., *Mathilda Thorden,* Mantyluoto, 139 bls. newsprint paper.
Wortendyke Manfg. Co., *Mathilda Thorden,* Mantyluoto, 572 rolls wrapping paper.

LOS ANGELES IMPORTS

WEEK ENDING APRIL 20, 1940

———, *Lauritz Swenson,* Ocean Falls, 2,481 rolls newspront paper.

Nekoosa Flat Screen
— connecting rod type —

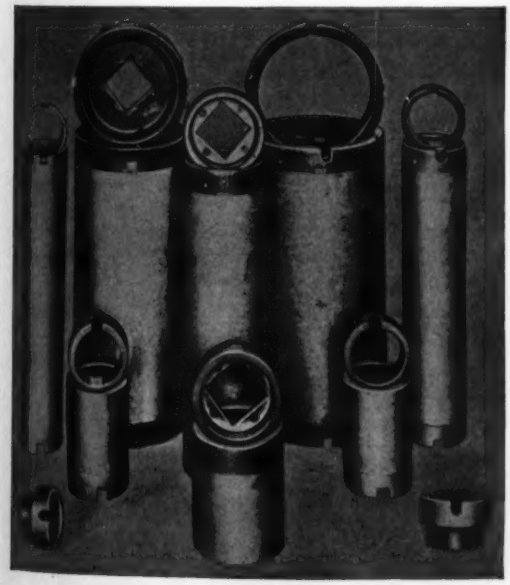


1. *Positive Action*
2. *Noiseless—No Vibration*
3. *Maintenance Negligible*
4. *Splash Lubrication*
5. *Customer Claims*
   30% More Capacity

Write us for complete details

Nekoosa Foundry & Machine Works, Inc.

NEKOOSA, WIS., U. S. A.



ELIXMAN

CAPS — Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This new patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted.

ELIXMAN PAPER CORE COMPANY, INC.

CORINTH, N. Y.

Paper & Cordage Association Meets

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., April 22, 1940—"Will Your Employees Vote" was the subject of Bruce A. Ludgate, Jr., Philadelphia Manager of Armstrong Cork Products Company, speaker at the monthly luncheon meeting of the Philadelphia Paper and Cordage Association in the Pompeiian Room of The Arcadia on Friday last. "It is well known that our country, the United States, is probably the last place on the earth where a person's vote means anything," said Frank Kurz, Whiting-Patterson Company, and secretary of the Association. As a result of this statement by secretary Kurz the younger element in the membership of the Association turned out in goodly numbers to hear Mr. Ludgate's council and guidance on this very important subject.

A motion was made by President George K. Hooper to amend the by-laws of the association, which motion was as follows:

"Any person engaged in the manufacture, conversion, sale or distribution of paper, cordage and similar products, as an employee shall be eligible to membership in the Association—such membership to be known as 'Associate Membership' and shall not entitle said member the privilege of voting or holding office but shall entitle him to other privileges. Dues shall be same as regular membership.

"The object of 'Associate Membership' is for the purpose of interesting non-members in joining the Association through the medium of 'Associate Membership.'"

The following were voted on and elected to active membership in the association: Holyoke Card and Paper Company, represented by Thomas A. Fockhart of Holyoke, Mass.; The Continental Bag and Specialty Corporation, represented by M. G. Condon, 601 West 21st street, New York; Reed Paper and Twine Company, represented by Aaron Freedman, 429 North 13th street; F. W. Hoffman, Inc., Janitors Supplies, 35 South 4th Street, represented by Paul L. Hansel.

F. A. Augsburg 75 Years Old

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., April 7, 1940—Frank A. Augsbury, president of the Algonquin Paper Corporation, has just observed his 75th birthday and is enjoying good health. He maintains daily charge of the concern and spends long hours attending to his business duties. In addition he owns extensive forest tracts in the Province of Quebec and operates one of the largest transportation enterprises on the Great Lakes. At present he is responsible for employing more than 300 men, most of them with families, at the Algonquin plant which is operating 24 hours daily. A product of Northern New York, he has risen from humble surroundings in the rural community of Plessis where he was born in 1865. About 1904 Mr. Augsbury and his brother became interested in the De Grasse Paper Company at Pyrites. About the same time Frank Augsbury became interested in the transportation of pulp from the vast acres of Canada via the St. Lawrence River. He controls also now the George Hall Corporation which operates a fleet of river and lake boats. Only recently he had a dozen modern freighters built in England at a cost of some $200,000 each and for many years the fleet was the pride of the Great Lakes. A number of years ago Mr. Augsbury was successful in organizing the Algonquin Paper Corporation which was a success from the start. Pulp was brought from the large Canadian tracts owned by him and the business flourished. Modern equipment was installed in the paper mill and for several years the plant has been running day and night with only occasional shutdowns to permit the cleaning of machinery. Throughout the recent depression this schedule has been maintained and employment is furnished to several hundred workers. Bond issues made at the time of the opening of the plant have been retired and the final issue is to be paid this month, leaving the entire control to Mr. Augsbury, his wife and son. Today the paper mill and its subsidiary do business which amounts to millions of dollars annually.

Will Use Old Markle Mill Plate

PHILADELPHIA, Pa., April 22, 1940—An unusual feature that will be incorporated in the historical sketch of the community of Roxborough-Wissahickon, which will be published by the 250th anniversary committee, will be the reproduction of a rare copper plate used locally by the paper industry in the early nineteenth century.

Interested in history and possessing many records, Harry S. Funk, a direct descendant of William Rittenhouse, who established the first paper mill here in 1690, offered his facilities to the committee. Later, while rummaging in an old trunk he uncovered the copper plate made for the Markle Paper Mill, which was operated on Paper Mill Run, a branch of the Wissahickon.

The plate incorporates an authentic reproduction of the Markle Paper Mill, and shows early merchandising efforts. It is inscribed as having been used by G. Markle. The print is very valuable, and the committee feels that its incorporation in the published volume will add to its rarity.

The books will be numbered in order of issuance to subscribers. Only 1,000 will be printed. The first book goes to Class Six, Wissahickon School. Months ago the class placed the order and the book will be presented to the Wissahickon School library by the class. Reservations have come from Florida, Tennessee, Virginia, Ohio, Illinois, New York and New Jersey. Former residents and those interested in the paper trade are placing these "out-of-town" orders.

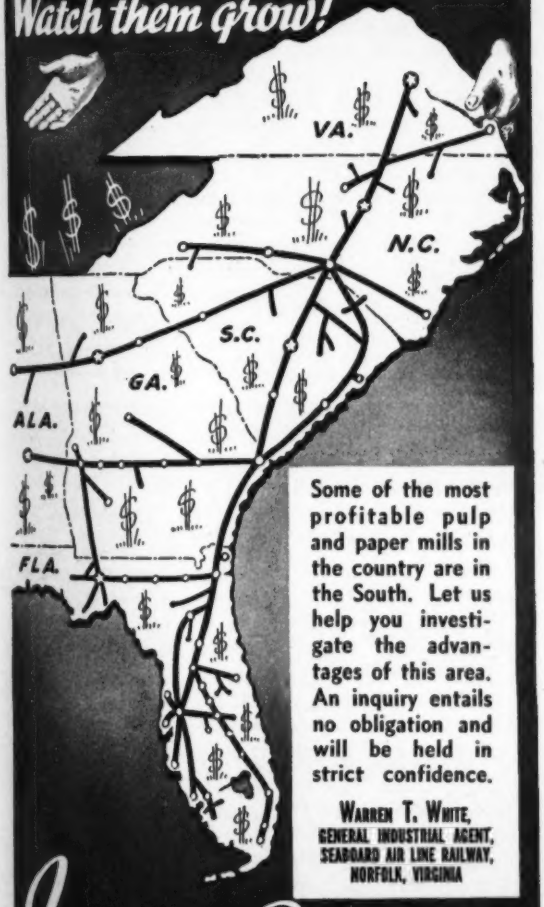
Placards are on display in a number of local places of business and factories, among which are the Hamilton Paper Company, Fiber Container, McDowell Paper Mills and many other outstanding business houses.

Notice to University of Maine Alumni

Owen W. Callighan, chairman, has issued the following notice to members of the University of Maine Alumni in the Pulp and Paper Industry:— "There will be no scheduled meeting of the Maine men at the American Pulp and Paper Mill Superintendents' Association Convention this coming June 18 to 20. The next scheduled meeting will be held at the time of the 1941 American Paper and Pulp Association and Technical Association of the Pulp and Paper Industry Conventions in New York City. You will be notified in ample time regarding the time and place of this New York meeting."

Get inside the PROFIT ZONE

Watch them grow!

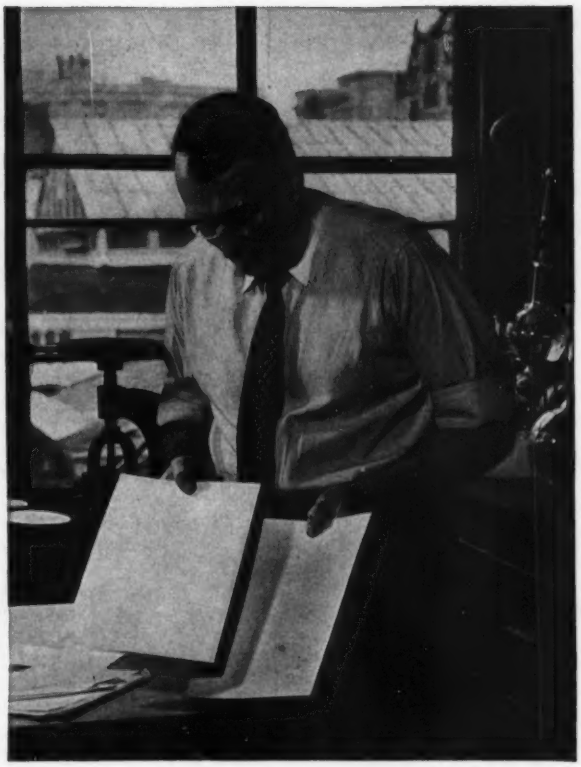


Some of the most profitable pulp and paper mills in the country are in the South. Let us help you investigate the advantages of this area. An inquiry entails no obligation and will be held in strict confidence.

WARREN T. WHITE,
GENERAL INDUSTRIAL AGENT,
SEABOARD AIR LINE RAILWAY,
NORFOLK, VIRGINIA

Industrial Department

SEABOARD



FOR A *Smoother,* HARDER SHEET

YOU SEE the difference, and you feel it, when you compare a sheet made the ordinary way and the same sheet made with PQ Silicate of Soda.

The silicated paper invariably has a smoother surface and a hardness that gives it a quality look. Paper chemists know that the better hydration from PQ Silicate results in better felting of the fibres. Hence, a smooth, hard surface.

Let our Technical Department discuss with you this advantage. It's important, of course, to use silicate properly, and we can tell you how.

SILICATES OF SODA

PHILADELPHIA QUARTZ CO.

General Offices & Laboratory: 125 S. Third St., Phila., Pa.
Chicago Sales Office: 205 W. Wacker Drive. Stocks in 60 cities.
Sold in Canada by NATIONAL SILICATES LTD., Toronto, Ont.

PQ

New York Paper and Pulp Market Review

Pulp Market Strong With Prices Up As Foreign Pulp Situation Becomes More Critical and Uncertain—Some Rag Prices Lower—Prices On Several Grades of Paper Stock Higher — Old Rope and Bagging Slow.

Office of the PAPER TRADE JOURNAL,
Wednesday, April 17, 1940.

Improvement in the sales volume of many grades of paper is indicated in the wholesale paper market during the current week, based on reports received from many manufacturers' representatives and general paper merchants this week. In some reports received from the trade, sales are higher but the average sales volume is approximately 5 per cent above that of last year at this date.

The index of general business activity advanced to 93.4 per cent for the week ended April 13, from 92.8 per cent for the preceding week, compared with 86.0 per cent for the corresponding week in 1939.

Paper production for 242 mills for the week ended April 13 was estimated at 83.4 per cent, compared with 80.3 per cent for 1939, with 68.0 per cent for 1938, with 93.0 per cent for 1937, and with 82.0 per cent for the like period in 1936.

Paper board production for the week ended April 13 was 66.0 per cent, compared with 67.0 per cent for 1939, with 58.0 per cent for 1938, with 88.0 per cent for 1937, and with 68.0 per cent for the corresponding week in 1936.

With the price of newsprint stabilized on a dual price basis of $49 to $50 per ton in rolls, by the announcement of Great Northern last month at $49 per ton for the second quarter, and later announcements by International and Canadian producers of $50 per ton, no change in the price situation is expected by the trade in the interim. It is the general opinion in the newsprint market that the combined domestic and Canadian mill capacity is ample to meet all demands for newsprint.

The critical situation in pulp has resulted in a strong paper market. Quotations on all grades of paper are very firm. Although higher prices are expected in the trade if the present Scandinavian pulp situation does not improve materially, no important changes have been reported to date. Some manufacturers have withdrawn prices and some producers are quoting day-to-day prices, but no substantial advance in paper prices is looked for in the trade. The prospect appears at this date for a moderate advance.

Mechanical Pulp

The mechanical pulp market continues firm. No important changes in prices have been reported to date.

Chemical Pulp

The critical situation in the foreign chemical pulp market has created uncertainty regarding the future and has resulted in much speculative comment which tends to confuse the current position of the foreign wood pulp market. It is the opinion of good authority that shipments of pulp from Sweden and Finland will be made, unless these countries should become involved in the conflict, in which unfortunate event foreign pulp prices would of necessity be withdrawn as no pulp from Scandinavia could be obtained.

Current contract quotations at this date on imported and domestic bleached sulphite range at from 3.00 to 3.50; easy bleaching sulphite, 2.75 to 3.40; strong unbleached sulphite, 2.75 to 3.25; bleached kraft, 3.37½ to 3.75; kraft, light and strong, 2.50 to 3.00, and No. 1 kraft at from 2.40 to 2.90.

Rags

Trading in the rag market is reported as moderately active in some of the higher grades this week. New unbleached rags are currently quoted at from 6.50 to 6.75. The only other important price change reported this week is on No. 2 roofing rags, currently quoted at from .80 to .85.

Old Rope and Bagging

The demand for old rope continues limited and trading is reported as rather slow. No important change from prevailing market quotations has been reported to date.

Trading in old bagging continues in moderate volume and while current prices are viewed in the trade as relatively low, no important changes have been reported for the week.

Old Waste Paper

Higher prices are reported on several grades of paper stock this week. Solid flat book is currently quoted at from .70 to .75; white ledger stock at from 1.70 to 1.80; old kraft, machine compressed bales, at from 1.30 to 1.40; strictly folded news, at from .50 to 52½, and corrugated at from .52½ to .57½.

Twine

Moderate activity is reported in the twine market this week. Prices are firm with the expectation in some quarters of the trade of a moderate upward revision in some grades of twine in the near future.

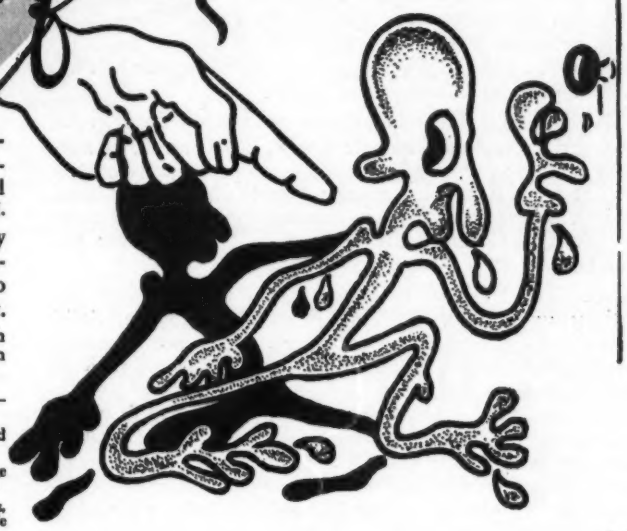
French Paper Co. Employees to Vote

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 24, 1940.—The National Labor Relations Board has ordered a secret ballot election within 30 days among the production and maintenance employees of French Paper Company, Niles, Mich., to determine whether or not they desire to be represented for the purpose of collective bargaining by Local 639, United Automobile Workers of America, affiliated with the American Federation of Labor.

On March 5 the Board authorized the Regional Director at Detroit to investigate and to provide for an appropriate hearing. On March 26 the public hearing was conducted. The company did not raise objection to the union's position on the proper bargaining unit and agreed that the above employees on the payroll of March 11 should be eligible to vote.

CLEAN UP YOUR PRODUCTION LINE BY FIRING *Slimform*



• When slime-forming organisms impair mill operations by increasing production costs, stealing paper-making materials and lowering quality of finished product, it's time to clean up—GET RID OF SLIMFORM.

Over 200 leading mills have banished Slimform by the use of chlorine and ammonia, economically controlled with W&T apparatus. The cost averages no more than from 1½ cents to 6 cents per ton of product.

Their experience can be yours. Write today for Research Publication No. 327—"Slime in Paper Mills—Its Origin and Prevention."

Stock losses—bacterial decomposition, reworking of stock

Lowered quality—slime spots—pin holes, objectionable odors

Increased costs—in water, heat, labor, chemicals

Maintenance troubles—blinded wires, plugged felts

Frequent clean-ups—slime breaks—poor sheet formation

Obstruction of lines—stock and white water lines

Recirculation difficulties—slime growths in recirculated systems

Mechanical strain on felts and wires, shortened useful felt and wire life

P-17

WALLACE & TIERNAN CO. Inc.

Manufacturers of Chlorine and Ammonia Control Apparatus

NEWARK, NEW JERSEY — *Other W & T Control Services:* — ***Branches in Principal Cities***

Automatic pH Control · Dry Chemical Feeders · Bleach Plant Equipment · Testing Instruments for Chlorine and pH

MORE PAPER...BETTER PAPER...FROM YOUR MACHINES

Every practical mill man knows that a major factor in running up costs comes in offweight and off-caliper sheets produced by the machines. Reduce the broke due to off-weights, speed up the Monday morning start-up, keep the machines producing steadily, and you're earning a better profit for your company. A sure way to accomplish this is through the use of Meyers Consistency Controllers. We can guarantee the Meyers Controller to maintain pulp stock density within one-eighth of one percent plus or minus from constant. Placed immediately ahead of the paper making machine, it will maintain sheet weight within 2½ percent of basis. *Write for Bulletin No. 1.* It describes the Meyers Consistency Controller, its principle of operation and specification details.

PROCESS CONTROLS, INC., LEROY, N. Y.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, April 24, 1940.

BLANC FIXE—Quotations on blanc fixe are firm and conform to prevailing market levels. The pulp is currently quoted at $35 per ton, in barrels, at works. The powder is quoted at $50 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm, with demand reported moderate. Prices are unchanged. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein continue unchanged for the week. Standard domestic casein, 20-30 mesh, is currently quoted at from 9½ to 10½ cents per pound; 80-100 mesh at from 10 to 11 cents per pound; all prices in bags, car lots. Argentina casein is currently quoted at 10 cents per pound; French casein at from 14½ to 15 cents per pound.

CAUSTIC SODA—Prices on caustic soda are firm and continue unchanged. Demand reported moderate. Solid caustic soda is currently quoted at $2.30 per hundred pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue to conform to prevailing market levels. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Prices on chlorine are firm and unchanged under a moderate demand. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market continues firm with prices unchanged at this date. "G" gum rosin is currently quoted at $4.95 per 280 pounds, gross weight, in barrels, Savannah. "FF" wood rosin is currently quoted at $4.90 per 280 pounds, gross weight, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.75 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake are firm under a moderate demand, and continue unchanged. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome salt cake at $16 per ton. All prices nominal, in car lots, f.o.b., shipping point. Imported salt cake quoted at $20 per ton is nominal.

SODA ASH—Quotations on soda ash are firm and unchanged at prevailing market levels. Demand continues moderate. Quotations on soda ash in car lots, per 100 pounds, are as follows; in bulk, $0.90; in bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and unchanged at prevailing market quotations. Pearl is currently quoted at $2.70 per 100 pounds; powdered starch at $2.80 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm, under a moderate demand. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and unchanged at prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm under a moderate demand and conform to prevailing market levels. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Imported talc is quoted at from $23 to $45 per ton.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.00	@	$5.50
Superstandard	4.62½	"	5.00
Northern Standard Wrapping	4.25	"	4.62½
Standard Wrapping	4.00	"	—
Tissues—Per Ream—Carlots			
White No. 1	.92½	@	—
White No. 1 M. G.	.90	"	—
White No. 1½	.70	"	—
White No. 2	.65	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.87½	"	—
Kraft	.80	"	—
Manila	.65	"	—
Unbl. Toilet, 1 M.	3.50	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	1.95	@	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. Ll. Chip	55.00	"	—
White Pat. Coated	67.50	"	—
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10@$46.00		$40.25@$47.25
100% Rag	31.05 " 36.50		32.20 " 37.75
85% Rag	.... "		29.90 " 35.00
75% Rag	23.60 " 27.75		24.75 " 29.00
65% Rag	.... "		21.65 " 26.25
50% Rag	17.55 " 21.50		18.70 " 22.75
25% Rag	14.65 " 17.75		15.80 " 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
No. 1	$8.95@$11.00		$10.10@$12.25
No. 2	8.05 " 9.75		9.25 " 11.25
No. 3	7.60 " 9.25		8.50 " 10.75
No. 4	7.30 " 9.00		8.50 " 10.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	8.35	"	9.50
No. 2 Offset	7.70	"	9.00
A Grade E. F.	7.50	"	8.75
A Grade S. & S. C.	7.75	"	9.00
B Grade E. F.	6.95	"	8.00
B Grade S. & S. C.	7.20	"	8.25
C Grade E. F.	6.65	"	7.75
C Grade S. & S. C.	6.90	"	8.00
D Grade E. F.	6.40	"	7.50
D Grade S. & S. C.	6.65	"	7.75

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	$38.00	@	44.00
Dry	38.00	"	44.00
(Delivered)			
No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.00	@	3.50
Prime Qualities—			
Easy-Bleaching Sulphite	2.75	"	3.40
Strong Unbleached Sulphite	2.75	"	3.25
(On Dock, Atlantic Ports)			
Kraft Bleached	3.37½	@	3.75
Kraft Light & Strong	2.50	"	3.00
Kraft No. 1	2.40	"	2.90
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	2.00	"	2.37½
(Delivered)			
Soda Bleached	2.90	"	—

Add 60 cents per short ton, the charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.25	@	7.50
Silesias No. 1	4.50	"	4.75
New Unbleached	6.50	"	6.75
Blue Overall	4.75	"	5.00
Fancy	2.25	"	2.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.15	"	3.35

Old Rags

White, No. 1—			
Repacked	3.25	"	3.50
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	1.10	"	1.15
No. 2	.80	"	.85
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.80
No. 5A	.60	"	.80

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	3.50	"	3.75
Light Flannelettes	3.50	"	3.75
New White Cuttings	7.00	"	7.50
New Light Oxford	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

J. Andersen & Co.

Selling Agents

21 East 40th Street

New York

CHEMICAL & MECHANICAL PULP

Kraft Pulp

BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanefjorden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NEMSJÖ CELLULOSA A.-B.
Sprängverkan, Sweden

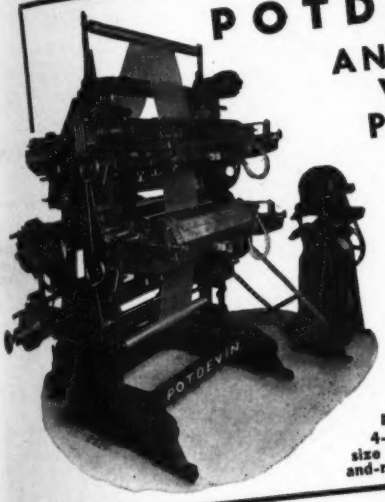
Bleached Sulphite

KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallsta & Vilsta, Austria

Unbleached Sulphite

AKTIESELSKABET GREÅKER CELLULOSEFABRIK
Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakia
SVANÖ AKTIEBOLAG
Svanö, Sweden

POTDEVIN ANILINE WEB PRESS



PMC 2524
4-color multi-size aniline roll-and-rewind press.

Experience is still the best teacher.
Paper mills, converters, and specialty printers consistently show their belief in this axiom with order after order for POTDEVIN multi-color, multi-length aniline web printing presses.

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THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.

Woolen manufacturers since 1856

ENGLISH ECCO CLAYS CLAYS

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens..	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light...	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging.....	2.25	"	2.50
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.50	"	4.75
Jute Threads.....	3.00	"	3.25
Sisal Strings.....	2.00	"	2.25
Mixed Strings.....	.70	"	.85

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	@	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag....	1.00	"	1.10
Solid Flat Book...	.70	"	.75
Crumbled No. 1...	.70	"	.75
Ledger White Stock.	1.70	"	1.80
Ledger Stock Colored	1.05	"	1.15
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine..	1.30	"	1.40
Compressed bales..	1.05	"	1.15
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue.	.70	"	.75
Strictly Folded....	.50	"	.52½
Corrugated	.52½	"	.57½
No. 1 Mixed Paper..	.27½	"	.30

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.18½	@	—
White Hemp.....	.18½	"	—
Fine Polished—			
Fine India.....	.23	"	—
Unpolished—			
Box	.14¾	"	—
Paper Makers.....	.15	"	—
Tube Rope.....	.16¼	"	—
Wall Paper.....	.15¾	"	—
Wrapping	.18	"	—
Soft Fiber Rope...	.16¼	"	—
Cotton	.21	"	—
(Hard Fiber)			
Medium Java.....	.19	"	—
Mex. Sisal.....	.16	"	—
Manila	.24	"	—

Domestic	—	"	2.50
Sisal Rope.....	2.20	"	2.50
Mixed Rope.....	.85	"	1.00
Transmission Rope—			
Foreign	3.50	@	—
Soft Jute Rope.....	3.00	"	3.25
Manila Rope—			
Foreign	4.25	"	4.50
Jute Carpet Threads.	1.50	"	1.75
Gunny Bagging—			
Foreign	2.75	"	2.85
Domestic	2.50	"	3.00
Bleachery Burlap....	3.50	"	3.75
Scrap Burlap—			
Foreign	2.60	"	2.65
Domestic	2.50	"	—
Scrap Sisal.....	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares, Heavy..	2.50	"	2.65
New Burlap Cuttings	3.25	"	3.50
Aust. Wool Pouches.	2.90	"	3.15
Heavy baling bagging	2.60	"	2.90
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.85	"	.90

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.04	"	.04¼
New White No. 1.	—	"	.07½
New Light Flannelettes	.05	"	.05¼
Silesias No. 1	.05	"	—
New Black Silesias..	3.20	"	3.25
Soft Unbleached...	.07	"	.07½
Blue Cheviots.....	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04¾	"	.05
New Black, Soft..	.03	"	.03¼
Khaki Cuttings.....	.03	"	—
O. D. Khaki.....	.03	"	.03½
Corduroy	.02¾	"	.03
New Canvas.....	.06¾	"	.07¼
B. V. D. Cuttings...	.07	"	.07½

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	—	"	2.75
Miscellaneous	2.00	"	2.50
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	1.50	"	2.00
Old Blue Overalls ..	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.00	"	1.25
No. 2.....	—	"	1.10
No. 3.....	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....	(nominal)		
Dutch Blues.....	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians.....	(nominal)		
Old Linsey Garments.	(nominal)		
New Silesias.....	(nominal)		

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1.	.07¼	@	.07½
New White No. 2.	.04	"	.04½
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04½
Black Silesias, soft	—	"	.03¾
New Unbleached..	.05½	"	.06
Washable, No. 1..	—	"	.04
Blue Overall.....	.04½	"	.05
Cottons—According to grades—			
Washable No. 2...	—	"	.01¾
New Blue	—	"	.01¾
Fancy Percales....	—	"	.03
New Black Soft...	—	"	.04
New Light Seconds	.04½	"	.05
New Dark Seconds	—	"	1.55
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.03½
No. 2 Mixed.....	.02½		.02¾
Corduroy	—	"	.02
New Canvas.....	.05½	"	.06
New Black Mixed.	—	"	.03

Domestic Rags (Old)

White No. 1—			
Repacked	3.25	@	3.75
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	—	"	1.50
Repacked	1.75	"	2.00
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....Nominal			
Domestic No. 1...	—	"	.90
Domestic No. 2...	—	"	.80
Roofing Bagging..	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.50	@	3.00
Manila Rope.....	—	"	4.50
Sisal Rope.....	1.75	"	2.00
Mixed Rope.....	1.00	"	1.25
Scrap—			
No. 1.....	2.50	"	2.75
No. 2.....	1.10	"	1.15
Wool Tares, heavy..	3.50	"	3.70
Mixed Strings	.75	"	1.00
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b. Phila.)

Shavings—			
No. 1 Hard Write	2.25	@	2.30
No 2 Hard White	2.00	"	2.10
No. 1 Soft White	1.85	"	1.90
No. 2 Soft White	1.50	"	1.60
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.50	"	1.60
Ledger Stock, white.	1.40	"	1.45
Ledger Stock, colored	1.10	"	1.20
No. 1 Books, heavy..	.85	"	.90
Manila Cuttings.....	1.75	"	1.80
Print Manila.....	.50	"	.55
Container Manila....	.40	"	.45
Kraft Paper.....	1.00	"	1.10
No. 1 Mixed Paper..	.25	"	.30
Straw Board Chip...	—	"	.40
Binders Board Chip..	.40	"	—
Corrugated Board....	.50	"	.60
Overissue News.....	.70	"	.75
Old Newspapers.....	.40	"	.45

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White	1.85	"	2.15
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.30	"	—
Overissue Ledger Stock	1.30	"	1.50
Mixed Ledgers.....	.85	"	.90
No. 1 Books, heavy..	1.00	"	1.10
No. 1 Books, light..	.65	"	.75
Crumpled Stitchless Book Stock.....	.55	"	.65
Manila Env. Cuttings	1.70	"	1.85
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.40	@	1.50
No. 1 Kraft.....	1.25	"	1.30
Mixed Papers.....	.27½	"	—
Print Manila.....	.50	"	.55
Container Manila...	.60	"	.70
Old Newspapers.....	.45	"	.50
Paper Wool Strings..	.90	"	1.00
Overissue News.....	1.00	"	1.10
Box Board Chips....	.35	"	.40
Corrugated Boxes...	.40	"	.45
Kraft corrugated boxes	1.00	"	1.10
New Kraft Cuttings.	1.35	"	1.45
Screening Wrappers	.60	"	.70

Bagging

(f.o.b. Boston)

Gunny Bagging—			
Foreign	—	"	2.85

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots.			
No. 1 White $36.50		@	—
No. 1 Tints	37.50	"	—
No. 2 White	26.50	"	—
No. 2 Tints	27.50	"	—
No. 2 Golden Rod..	28.50	"	—
No. 3 White	22.00	"	—
No. 4 White	15.50	"	—
No. 4 Tints	16.50	"	—
No. 4 Golden Rod..	17.50	"	—
Direct mill shipment in three-ton lots.			
No. 5 White $10.40		@	—
No. 5 Tints	11.40	"	—
No. 5 Golden Rod..	12.40	"	—
No. 6 White	9.40	"	—
No. 6 Tints	9.90	"	—
No. 6 Golden Rod..	11.40	"	—
No. 7 White	8.40	"	—
No. 7 Tints	8.90	"	—
No. 7 Golden Rod..	10.40	"	—
Book—			
No. 1 M. F.	$7.75	"	—
No. 2 M. F.	7.25	"	—
No. 3 M. F.	6.60	"	—
No. 1 S. C.	8.25	"	—
No. 2 S. C.	7.75	"	—
No. 3 S. C.	6.25	"	—

Coated Book & Litho

Ton Lots (resale)

No. 1 .....$12.15		@	—
No. 2	10.50	"	—
No. 3	9.45	"	—
Coated tinted.....	13.20	"	—
Golden Rod.....	14.80	"	—
Wrapping—delivered—			
Rag Brown.....	4.85	"	5.25
White Wrap.....	4.00	"	—
"B" Manila.....	4.90	"	6.15
No. 1 Manila....	$5.50	@	$6.00
Fiber	5.50	"	6.00
Kraft No. 2.....	5.50	"	6.00

(f.o.b. Cars, Toronto)

News per ton—			
Rolls (contract)..	46.00	"	—
Sheets	54.00	"	—

Pulp

Ground wood.....$36.50		@	—
Unbleached sulphite.	54.00	"	—
Bleached sulphite...	65.50	"	—
Kraft	47.50	"	—
Soda	58.00	"	—

Old Waste Paper

(In carload lots, f.o.b. Toronto)

Shavings—			
White Env. Cut...	2.40	@	—
Soft White.....	2.00	"	2.15
White Blk. News..	1.35	"	1.50
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	"	1.00
Light and Crumpled Book Stock.....	.80	"	.90
Ledgers and Writings	1.15	"	—
Manilas—			
New Manila Cut..	1.55	"	1.60
Printed Manilas...	.70	"	—
Kraft	1.15	"	—
News and Scrap—			
Strictly Overissue	.75	"	—
Strictly Folded ..	.70	"	—
No. 1 Mixed Paper	.60	"	—

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings..	2.40	@	—
No. 1 Hard White	2.15	"	2.20
No. 1 Soft White.	1.85	"	1.95
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.05
Blanks	1.50	"	1.65
Krafts	1.15	"	1.35
New Kraft Cuts.....	1.40	"	1.50
Overissue News.....	.80	"	1.00
Old Newspapers—			
No. 1 Folded News	.65	"	.75
No. 1 Mixed Paper	.35	"	.55
Roofing Stocks—			
No. 1.....	.95	@	1.00
No. 2.....	.85	"	.90